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**REPORT
OF
THE
ENVIRONMENTAL STATEMENT
WORKSHOP**

**Charlotte, North Carolina
August 29-31, 1973**

**South Regional Technical Service Center
Fort Worth, Texas**

ENVIRONMENTAL STATEMENT WORKSHOP

Charlotte, North Carolina

August 29, 30, and 31, 1973

A G E N D A

		<u>Pages</u>
<u>Wednesday, Aug. 29</u>		
8:00 - 8:30	Need for Environmental Planning and Statements J. L. Hicks, State Conservationist, Raleigh, North Carolina	1-3
8:30 - 9:00	What is Expected from States and RTSC in the Content and Editorial Quality of Environmental Statements W. L. Vaught, Director, South RTSC, Fort Worth, Texas	4-10
9:00 - 9:30	Desired Scope and Quality of Environmental Statements Karl Klingelhofer, Director, Watershed Planning Div., Washington, D. C.	11-22
9:30 - 9:45	BREAK	
9:45 - 11:30	Environmental Planning Review of Procedures Jack W. Adair, Head, EWP Unit, South RTSC, Fort Worth, Texas	23-39
	Investigations Related to Plant Science T. V. Jamieson, Agronomist, South RTSC, Fort Worth, Texas	40-48
	Other Investigations Douglas Peet, Watershed Planning Spec., South RTSC, Fort Worth, Texas	49-72
11:30 - 12:00	Proper Format and Content and Common Deficiencies of Environmental Statements Gerold Lamman, Soil Conservationist, Washington, D. C.	73
12:00 - 1:00	LUNCH	
1:00 - 4:30	Review Environmental Statements Grouped by States	
<u>Thursday, Aug. 30</u> All Day	Continue Review of Statements	
<u>Friday, Aug. 31</u>		
8:00 - 10:00	Discuss Problems in Environmental Planning and Environmental Statement Preparation Presented by Each State	74-85
10:00 - 10:15	BREAK	
10:15 - 12:00	Panel Review and Critique of Workshop Representative from Each State	

NOTE: The names of those who attended are listed on the inside of the back cover.

ENVIRONMENTAL PLANNING AND PREPARATION

OF ENVIRONMENTAL STATEMENTS

Welcome to North Carolina, the "Tar Heel" state, and to Charlotte, the "Queen City." We are happy to have you here for a very important three days.

The purpose of this workshop is to improve our skills in the preparation of environmental statements.

Environmental statements are now a very necessary part of the planning process. The general public in North Carolina, like all states, is concerned today about the environment and about environmental planning.

North Carolina is referred to often now days as a "variety vacation-land." Our coastal areas and our mountain areas are under considerable pressure due to tourism and recreational development. The piedmont crescent is rapidly urbanizing and industrializing. This is no different from situations in most other states in the South Region.

In addition, North Carolina has 320 miles of coastline, 3,645 square miles of inland water, and another 100,000 acres of Juncus marshes. It has a 14 million dollar commercial fishing industry. Further, North Carolina is the largest lumber producing state in the South and fifth in the nation.

It is a leading state in forestry and forest products. It is the largest producer of furniture.

Together, with all this North Carolina has always been and still is one of the leading agricultural states -- being first in the production of tobacco and tobacco products (including cigarette paper) and sweet potatoes. It is second in peanuts, cucumbers, and pickles. It is second in the number of farms and farm workers.

I simply mention these things to show that there is a wide variety of economic interests, interest groups, and organizations in North Carolina. People are concerned about the various aspects of the economy in North Carolina. They are likewise concerned about the various aspects of their environment and they let us know about these concerns when they review and comment on our environmental statements.

I am sure you are having similar experiences in the other states represented here today.

The Administrator, in Advisory WS-26, advised us that even though

Comments by Jesse L. Hicks, State Conservationist, at the Environmental Planning Workshop, Charlotte, North Carolina, August 29, 1973

improvements have been noted in recently prepared environmental statements, we must continue to improve the quality of statements. Actually, the preparation of satisfactory environmental statements must be preceded by environmental planning. It is impossible to discuss alternatives adequately if alternatives were not considered in the planning process. This carries throughout the entire planning process.

In this workshop, we hope to set forth the desired scope, content, and quality of environmental statements and the planning input required to attain these objectives.

The passage of the National Environmental Policy Act of 1969 (PL 91-100) placed a legal responsibility on all federal agencies to carefully consider the effects of any proposed project on the over-all environmental setting. It also set up the requirement that "major federal actions significantly affecting the quality of the human environment" have a detailed statement. We must consider:

1. The environmental impact of the proposed action.
2. Any adverse environmental effects which cannot be avoided.
3. Alternatives to the proposed action.
4. The relationship between local short-term uses of man's environment and long-term productivity.
5. Any irreversible and irretrievable commitments of resources.

This Act, with its requirement for environmental statements, is a "law of the land." As a federal agency, it is our responsibility to comply with this law just as it is our responsibility to comply with all other laws. We are not preparing environmental statements in order to get along with other agencies. We are not preparing environmental statements to justify projects already planned. We are doing it because it is required by law -- and there is no indication that the law will go away. The "Clean Water Act of 1972" is a good indicator of the thinking of Congress in relation to the environment.

The Administrator has told the State Conservationists on several occasions that we must do the best job possible in preparing environmental statements and that this is high priority work.

At the meeting of State Conservationists in Brainerd, Minnesota, in September 1972 he said, "I am proud of our progress towards meeting both letter and spirit of the National Environmental Policy Act of 1969. In focusing our attention on the environment and in working with other interested agencies and groups with somewhat different points of view, we are improving our planning, broadening our consideration of alternatives, and making adjustments in plans and designs where necessary."

In view of more recent developments and as a result of recent comments from CEQ and others, it appears that we must now do an even better job than we have been doing. We must continue to improve this aspect of our work.

We have been trying our very best in North Carolina to do a good job in preparing environmental statements. It's not a question of not wanting to comply with NEPA. It's a question of HOW? And we are going to talk about this the next three days.

We have had frustrations due to changes in our requirements and procedures. States have not always had proper advice from our Washington Office or the RTSC. The Washington Office and RTSC on the other hand could not always give proper leadership because of the changes taking place outside of SCS. There is an indication that we are settling down and we must now all work as a team in getting this job done.

The Chicod Case in North Carolina was a test case on whether or not NEPA was retroactive. The judge ruled that NEPA is retroactive and that all projects prior to NEPA come under the law. An environmental statement was then prepared on the Chicod and the State Conservationist and others on the state staff were called on to defend the statement in court. Based on this experience, I am convinced that we must have complete factual information in our environmental statements -- information that can be defended in a court of law.

We have a need for definite guidelines and policy with regard to preparing environmental statements. However, we must allow for flexibility. We can "goosestep" ourselves out of the watershed business. We must learn to prepare quality work plans and environmental statements as well as quantity. The environment statement is not an "end in itself." A watershed work plan is not an end in itself. Both are a means to an end. The end product is getting conservation on the land which results in a quality environment and a quality of life for our citizens.

Again, it is a real pleasure to have you in North Carolina. I hope you have a very pleasant and profitable three days. If we can help you in any way while you are here, please let us know.

Content and Editorial Quality of Environmental Statements

W. L. Vaught, Director, South RTSC, SCS
Fort Worth, Texas

As a nation we are experiencing increased emphasis on pollution control and environmental quality. The focusing of attention on the subject is evident at all levels of government and the society. In August 1970, President Nixon included the following in his message to Congress:

"The basic causes of our environmental troubles are complex and deeply embedded. They include our past tendency to emphasize quantitative growth at the expense of qualitative growth; the failure of our economy to provide full accounting for the social cost of the environmental pollution; the failure to take environmental factors into account as a normal and necessary part of our planning and decision-making; the inadequacy of our institutions for dealing with problems that cut across traditional political boundaries; our dependence on conveniences; without regard for their impact on the environment, and more fundamentally, our failure to perceive the environment as a totality and to understand and to recognize the fundamental interdependence of all the parts, including man himself."

As President Nixon noted, the environment is a totality, a "system" or "eco -system", and we are just beginning to realize and recognize the interdependence of the parts, particularly in relation to man. We want conveniences of home appliances, packaged foods, interstate highways, jumbo jet airplanes; however, we are not ready to admit that we, as individuals, contribute to environmental pollution by the residues of our conveniences.

A most important requirement of the National Environmental Policy Act of 1969 is that every major Federal action, significantly affecting the quality of the human environment, be described in an appropriate environmental statement. Herein lies much of our problem. (There is still much argument over what is a major Federal action -- but court cases are clearing this up fast.)

The Administrator has recently issued Watersheds Memorandum-125 which instructs the state conservationist and the RTSC director to agree on content and the quality of watershed work plans and environmental statements.

We are charged with the responsibility of determining that work plans and environmental statements adhere to SCS policy and are technically proficient and well written. These three items may appear to be fairly simple to accomplish, however, past experience has shown us that this is not the case.

(Discussion of CEQ letter to Secretary of Agriculture)

Let's turn to our objective this week. After we discuss what is expected from states and RTSC's we will look at some of the problems being encountered in the preparation of environmental statements. Gerold Lanman and Karl Klingelhofer will review specific deficiencies that have been noted by RTSC, the Washington office, other agencies and by the Council of Environmental Quality. For the discussion we will note that critiques of current statements constantly refer to items that stem from lack of adequate interdisciplinary review, proper checking, or even simple proofreading. Out of this workshop we hope the quality the SCS is looking for (and I repeat we are still seeking) will be found.

Jack Adair, Doug Peet and T. V. Jamieson will review procedures and investigations for environmental planning. Probably all the discussion leaders will point out to you the problem we have in trying to write statements on approved projects where data on sediment floodwater volumes, and economics is plenty inadequate but we have very little data on other environmental effects.

How Do States Develop Quality Statements?

WS-125 assigns the responsibility for determining that work plans and environmental statements adhere to SCS policy and are technically proficient and well-written jointly to the state conservationist and Director, RTSC. We need now to examine our procedures to be sure that they are responsive to this charge. We must be sure the quality of documents transmitted to the RTSC is sufficiently high to meet acceptable standards and any deficiencies found are corrected before the documents are transmitted to Washington.

Let me emphasize that each state has the primary responsibility for the adequacy of work plans and environmental statements. Each state should have a review procedure which will assure that:

1. Plans and statements are technically proficient and adhere to Service policy. This means:
 - a. Surveys and investigations are adequate.
 - b. Basic data have been analyzed properly.
 - c. The plan conforms to the technical standards and requirements of the Service.

- d. It reflects the kinds of measures to be installed and all reasonable alternatives and their effects.
 - e. The documents meet the requirements of handbooks and other guides.
2. They are of acceptable quality in format and grammer.
 3. They are correct in spelling, free of typing errors, and of acceptable editorial quality.
 4. All data are correctly stated, cross-checked in tables, and agree with the narrative.

Each state conservationist must set up a procedure, usually by a committee utilizing all of his staff resources and talents, to assure himself that these items are accomplished before preliminary drafts are submitted to the RTSC.

How Does the RTSC Staff Respond? The RTSC will distribute the first drafts of work plans and environmental statements to each specialist for review and comments with the objectives of determining that:

1. Surveys and investigations are adequate.
 2. Basic data have been analyzed properly.
 3. The plan conforms to the technical standards and requirements of the Service.
4. It reflects the kinds of measures to be installed and all reasonable alternatives and their effects.
 5. The documents meet the requirements of handbooks and other guides.

Our comments will center on these five important items and will, when necessary, recommend methods of correcting them. If our review indicates errors or that editorial improvement is needed, we will so indicate either by letter or in notes in the document. -7-

In view of WS-125 instructions, we will dwell more on editorial excellence than we have in the past. However, it must be kept clearly in mind that the workload of the South RTSC makes it impossible for us to assume significant responsibility for editorial excellence or corrections of copy. We will point out errors we see in the review process, but you should not consider this to be a comprehensive review to detect all errors. If the document, in our opinion, is poorly written, we may return it with some examples of recurring errors or possibly with a few pages edited to serve as an example for the state to use in rewriting the document. But this will be limited. Format may also be used as an example to follow throughout the plan when re-submitting it to RTSC for comments. I want to point out too, that I have adopted the practice of talking directly with state conservationists about certain aspects of letters I sign to them. I will continue to do it this way.

As in the past, we will exert all possible effort to have the concerned RTSC specialists review the drafts of work plans and preliminary drafts of environmental statements and return our letter of comments within 30 days.

When we receive copies of documents responding to our comments, our watershed planning specialist will review them with only limited consultations, when needed, with other RTSC specialists. I then expect Jack Adair to read them and pass them to my office, and I assure you either I or the Acting Director will read most of the plan and all the environmental statement. Obviously, we hope you have the documents so well prepared we can reply in much less time than the 30 days required for the final review, and a letter of concurrence. I also believe and will say to state conservationists, that they too read these documents.

In summary, the determination that work plans and environmental statements adhere to SCS policy and are technically proficient and well written is a joint responsibility of the state conservationist and the Director, RTSC. The responsibility for editorial quality and correctness of copy will rest with the state conservationist with limited assistance available from RTSC.

Possibly some of our trouble has been in not knowing what was needed in an environmental statement. (Rules have changed from time to time.) Also, it has become most apparent that adequate statements cannot be written unless supported by adequate planning. Too often an adequate environmental statement cannot be prepared because adequate data are not available. For these reasons, we are devoting a small part of this workshop to a cursory review of the planning process touching on those items that must be considered in evaluating the impact of the project on the overall environmental setting. Others will go into project planning later in the program.

This workshop is in response to a discussion in January by all state conservationists in a meeting in my office. We have arranged this workshop to do our level best to assist you in preparing statements with the quality, the degree of investigations, the environmental planning input and the editorial excellence that is essential. The state conservationist is responsible for the quality of documents in his state, and it is your responsibility to lay before him a quality product.

Therefore, you let him down flat when that product is anything less than top quality. He depends on you for this, but when the Administrator enters the

picture because of poor quality, the only person he talks to is that state conservationist.

If this sort of session does not prove to be fruitful, I would like for you to be frank with us. These aren't scheduled for the sake of saying we had one -- but rather to in fact bring you some useful working tools to help you do a better job. We can't afford the time or money to do otherwise.

Notes for K. R. Klingelhofer Presentation at Environmental Workshop,
August 28, 1973, Charlotte, North Carolina

Work Plans and Environmental Statements - Need quantity and quality

Quantity for an active program

Quality also a must

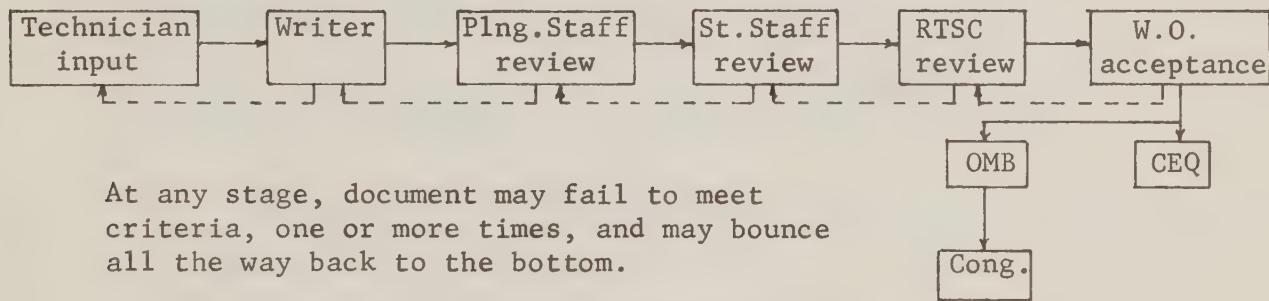
Which comes first or is most important?

If you have to make choice, which would you emphasize?

I would say that you must have quality first.

If you don't, you can not get quantity because
a poor quality work plan or environmental statement
will bounce back and forth between writer and reviewers.

Consider all the steps in the process



At any stage, document may fail to meet criteria, one or more times, and may bounce all the way back to the bottom.

To increase quantity, improve efficiency by improving quality.

Also limit number of jobs working on at one time.

When plan or statement needs changes, do it immediately or rules may change such that you have to start all over.

30-day Fort Worth turn around - excellent.
W.O. has similar goal. No present backlog.

Reference made to thought that SCS system to fully implement NEPA is not working. We still haven't achieved the level of competence needed. Possibly our biggest problem is our "attitude". Have we reached the point where we can admit to ourselves that we have made some mistakes in the past and that improvements are needed? If we have not, then we are not in the proper frame of mind to assimilate new guidelines for environmental planning and preparing environmental statements.

Also, when outside expertise is needed, take steps to acquire. In 74 budget requests, only 18 states indicated plans for using contracts to acquire services.

Summary of recent communications from the Washington Office that you should be aware of:

Advisory Watershed-31, 8-20-73 - Formulation and Evaluation of Watershed Projects

- a. 5-5/8 percent to 6-7/8 percent interest rate
- b. Principles and Standards will probably be printed about Sept. 5 and effective 45 days after published unless Congress introduces a delay.
- c. Will modify the criteria for justification of projects
- d. Two objectives and probably four accounts
- e. Suggest delay final stages of project formulation and drafting of new preliminary draft work plans.
- f. Continue technical review of drafted work plans but no E&WP Unit concurrence.
- g. May submit draft and final work plans which are ready for final processing.
- h. Continue EVT assessment, collection of basic data, PIs, and writing EVT statements.

Advisory WS-28, 8-10-73 - Watershed Work Plans

- a. New names for watershed work plans to be the same as for environmental statements.
- b. Sponsors not sign work plan agreements until final plan is drafted. Letter of concurrence on draft plan.
- c. Final plan should reflect current price levels for costs and benefits as well as the applicable interest rate.
- d. Applicable to all plans not yet transmitted for interagency review.

Advisory WS-26, 6-25-73 - Environmental Statements for Watershed Projects

- a. This will be thoroughly covered during this session by others.
- b. Drafted before CEQ letter.

Advisory WS-25, 6-12-73 - Revised Form SCS-WS-311 - Watershed Planning Activities

- a. Submit every two months
- b. Required in Chapter 16 of the Handbook
- c. Use new forms
- d. Complete all appropriate blanks

Advisory WS-24, 6-12-73 - Distribution of PL-06 Funds

- a. Request for Watershed Planning information to be used in allocation of 06 funds to individual states.
- b. Only 18 states requested funds for contracting (\$221,500).
- c. Supplements to be prepared with 06 funds should have been requested.

Advisory EVT-27, 8-21-73 - Typical Impacts for Typical Actions

- a. Direct physical impacts - indirect or secondary impacts - economic and social impacts
- b. Reservoir may result in decreased flooding (direct impact). Decreased flooding may result in increase in production (indirect impact) which results in net increase in farmer's income (economic and social impact).
- c. Only a check list to help you identify impacts which should be described. List is tentative, suggestions for improvements will be welcome.

Advisory EVT-25, 8-17-73 - Environmental Assessment Procedure

- a. Developed by multi-discipline Washington Office committee
- b. Transmitted for information only
- c. Being tested in a watershed in Pennsylvania
- d. Will be incorporated into the new guidelines for implementing WRC principles and standards as appropriate.

Watersheds Memorandum-126, 7-20-73 - Local Participation in Planning

- a. Establishes that other agencies and interested organizations will be invited to participate in the planning process starting at a very early stage.
- b. They will be asked what assistance they can provide, whether they wish to be involved, and how they wish to participate.

W/S-126 (cont.)

- c. Responsibility of sponsors to make formal contact. If sponsors decline, SCS must then pick up the ball.

Watersheds Memorandum-125, 3-23-73 - Review of Watershed Work Plans and Environmental Statements

- a. Requires RTSC concurrence of preliminary draft, draft and final work plans, and environmental statements and supplemental work plans, before Washington Office reviews or processes these documents.

Watersheds Memorandum-121, Supplement 1, 6-26-73 - Environmental Statements for Watershed Projects Approved Before January 1, 1970

- a. Except for change in processing procedures this supplement only extends the effective period of the original WS Memorandum 121.

NEPA Handbook Committee

- a. Objective to standardize NEPA procedures within SCS
- b. RC&D and watersheds the same
- c. To be published in Federal Register after review by CEQ
- d. Establish thresholds to determine when environmental statements must be prepared - all watershed projects will not require environmental statements.
- e. Negative declaration required
- f. All draft environmental statements will probably be signed by state conservationists. (Final environmental statements?) RTSC will continue review for concurrence. Washington Office will give approval for state conservationist to sign and transmit draft to CEQ.

Section 2000, ASD Handbook

- a. 2204.031 Flowage rights

Emergency spillway crest +2' or emergency spillway crest + 0.6' depth to top of dam whichever is greater. No emergency spillway - use top of dam. Elevations above apply to buildings and all public roads.

- b. Effective date - August 1 unless L.R. maps furnished and negotiations started.

Watershed Protection Handbook in Federal Register

- a. All policy that affects the public
- b. By this fall
- c. Can't change without 30 or 45 day notice.

Cost of Statement in Relation to Cost of Project

50 pending - \$2.2 M (566) \$3.8 M (total)

Ave. cost/plan last 3 years -\$250,000

In future \$200,000?

1/2 for NEPA - \$100,000?

10% for statement \$20,000?

5% for statement \$10,000?

How many of you consider yourselves as planners? If yes, do some of the conclusions in the following report apply to you?

March 1973

TOWARD A PHILOSOPHY OF PLANNING:
ATTITUDES OF FEDERAL WATER PLANNERS

by

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Project 16110 DWX

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ABSTRACT

The study was made to examine the attitudes, opinions, and perceptions of field level planners and their supervisors in the U.S. Army Corps of Engineers, the Bureau of Reclamation and the Federal Water Quality Administration (now Environmental Protection Agency). It is held that field planners can largely determine the direction of agency plans. Because many planning decisions are subjective, planners' attitudes may strongly influence their judgment. Existing knowledge of attitudes at this level is limited, and the study helps to explain some of the reasons for the current pattern of federal water management and identifies areas where changes in policy and planning practices may be needed.

An interview survey of 70 planners (GS-11 to 15) was conducted. Offices were chosen to ensure a wide coverage of hydrologic regions and management tasks. Each interview was conducted by a team of two researchers. Attitudes toward planning objectives, personal role, the social-political structure, time and the environment were explored. Results of the interviews are summarized and discussed in relation to accepted concepts of the planners' role.

This report was submitted in fulfillment of Research Grant No. 16110 DWX under the partial sponsorship of the Office of Research and Monitoring, Environmental Protection Agency.

CHAPTER VIII

PHILOSOPHY AND CONCLUSIONS

This study was undertaken to attempt to describe the planning philosophies of a sample of federal water resource planners. No uniquely identifiable outlook emerged and the overall image was somewhat confusing. Many planners had apparently never attempted, nor had an opportunity, to give form to their basic beliefs. Often the survey seemed to be as much a learning process for the interviewees as it was for the researchers. Nevertheless, there were some characteristic beliefs common to a majority of planners and two primary planning emphases were evident.

View of Nature

Most planners' images of nature and the environment were pragmatic, rarely going beyond physical attributes. Nature and water were valued for their contribution to man in terms of their resource potential rather than for the metaphysical benefits they may provide or the broader ecological functions served. There was uncertainty about man's understanding of, and ability to, influence nature, and except in a limited sphere his efforts were frequently held to be merely destructive. Planners were aware of current environmental problems but generally considered them manageable. The policy sought was for a non-panic, balanced approach, reflecting both a common sense outlook and the necessity to compromise because of the difficulties of having to arbitrate between conflicting demands for preservation and development.

Because nature is a subjective issue, it may be impossible and even unnecessary to expect a coherent outlook on its value to man. There is, however, a need to develop techniques to enable planners to more clearly illuminate the environmental-economic trade-offs in their plans. It is important that methods be flexible and that agency planners be aware of their limitations, so that the danger of imposing an additional value structure on, or obstacle to the planning process is avoided. Some of the confusion and feelings of inadequacy could be eliminated by exposing all planners and engineers to the basic principles of ecology. Certainly ecology is better understood and can furnish more information about man's influence on natural systems than most engineers realize.

View of the Future

The future world envisioned by planners is a conservative one. The horizons are generally less than twenty-five years, far shorter than the agencies' planning periods. However, little change in the pattern of growth is expected and optimism about the availability of resources is strong. Existing technology and institutions are seen as being adequate to meet most future problems.

This is a satisfied, non-demanding view, leading to an incremental approach to problems. Planners see their task simply as meeting the demands of an expansion of the present situation. There is little awareness that resources are now limited and no apparent sense of a need to change the current reliance on "growth for growth's sake." If more imaginative approaches are not sought, current planning may simply exacerbate today's environmental and social problems. Since distant futures must be planned for, despite the planners' distrust of long projections, there is an indicated need for wider use of forecasting methods which are sensitive to changes in major parameters and give contingency limits or forecast ranges of demand under a variety of possible decision sequences, rather than simply relying on a single value prediction.

Planning Roles

The differences between planners are most evident in the concepts of their own role, or function, which were summarized in their definitions of a planning philosophy (Appendix 3c). About four in seven saw themselves as technical consultants whose primary responsibility is to develop projects. Their focus is on the means rather than the goals. They work to satisfy specific local needs over the demands of broader national objectives. This does not imply that their work is responsive to the public, since influential local interests may have very limited concerns. These planners maintain their right to make value judgments by virtue of their position or expertise, or because of perceived incompetence of the public. They wish to involve outside interests on an informational level, but just to expedite or give legitimacy to their proposals.

A second group of planners were more aware of the full function of planning. Their interests lay in the plan's achievements and in demonstrating the consequences of alternative actions. They were more willing to accept a broader set of interests and to allow a more significant community involvement in developing plans. Their approach appeared more likely to be broadly responsive to social, physical and economic needs.

The differences between these groups is close to that between a technocratic (elitist) outlook and that of the professional technologist. Part of the explanation for the two views is undoubtedly the traditional agency orientation to the first position, as opposed to the growth in consciousness of the need for a more comprehensive planning approach. Many planners, or at least men in what are considered planning positions, are actually doing an engineering task. This is a necessary role, but it should not be confused with the goal interpreting responsibility of planning.

The need for long-range, broadly integrated plans which ensure that state and regional proposals consider national and even world-wide interests, social and environmental as well as economic goals has never been greater. The limited outlook demonstrated by many of those interviewed would be acceptable for state agencies but is no longer a prerogative of federal planners.

The federal agencies are in the logical position to carry out long-range, independent planning. Planners should be freed from the constraints of providing projects as the solution to all needs by separating their role from the design and construction activities of the agencies. Because there is potential for the development of an elite and for coercion of the public in such a situation, the individual's responsibility to maintain a service motivation and his need for a social conscience is increased.

Goals

The planners' knowledge of the laws and understanding of the goals controlling their agencies' functions was poor. Awareness of the social impact of water resource projects and the need to include social considerations in what has hitherto been seen largely as a technical task was almost non-existent. However, it was evident that knowledge of goals and exposure to planning done under a multi-objective approach was accompanied by a growing social consciousness.

Thus, before planning in the sense discussed above can be made effective and responsive the planners must be given greater exposure to the general concepts of planning and its implications for society and education in the area of agency goals, legislation and policy. Agencies should encourage more men to undertake university studies in multidisciplinary programs. In-house courses on the laws and goals governing the agency, how these laws are interpreted in policy directives and the process by which plans move from initiation to authorization and appropriation should be required for all members of a planning team. Programs to give potential supervisors an overall view of the agency should be emphasized. The effectiveness of educational efforts could be multiplied by requiring men who attend periodic planning seminars or university programs to relay new ideas to their colleagues through seminars, papers, memoranda, etc. This process would not only disseminate new concepts, but would help the individual to maintain his own interest and crystallize his thoughts. The opportunity to refresh ideas should also be available through a "sabbatical leave" plan. Even "reverse" sabbaticals could be encouraged, by which professors and doctoral students in university planning programs could be brought into the field offices of the agencies, both to give the academics some understanding of the practical requirements of plans and to enable a wider spectrum of agency personnel to be exposed to newer ideas and concepts. Such ideas are expensive and time consuming, but these costs must be borne if planning is to be improved.

Public Involvement

It was clear that the planners did not hold very high opinions of the public's competence and ability to aid their plans. Many planners demonstrated something of an elitist outlook. Public involvement was desired primarily as a means to expedite final acceptance of the planner's ideas, not to ensure the responsiveness of his plans. The public was to be co-opted. (This of course may be considered as a first step toward a better public role since at one time the agencies did not even have to make this effort, but it does not go far enough and such attitudes must not be allowed to become formalized.)

A point for planners to consider is that given the subjectivity of many of their decisions, they may be no more, and perhaps less, qualified than the public to make certain choices. Society must have the right to set its own values. The public should not have to wait until planners seek their response before they participate. An informed and involved public can help ensure the accountability of government plans.

To increase the responsiveness of plans, planners must be convinced of the value of contributions by the public. Increased confrontation of the planners and the public is essential. The evidence is that planners who have been exposed to efforts to involve the community are more likely to accept public control or political arbitration of plans. Such attempts should be increased through the use of public forums, referendums on major issues and opinion surveys together with planning workshops, local government and citizen group meetings. Public education programs to give laymen an understanding of the planners' problems and the confidence and incentive to propose their own ideas must also go forward.

Attitude Variations by Age

There were sufficient differences between the views of the younger and older planners to indicate a shift in priorities away from economic goals. However, young planners were not less, and often more, distrustful of public motives and the political process than their seniors. Their knowledge and understanding of the principles and laws governing planning were more limited than older men or those in higher grades. Thus more emphasis on multi-disciplinary planning education in engineering schools is needed to supplement agency in-house training programs. Greater emphasis should be given to economics, political science, ecology and descriptions of the various models and requirements of the planning process.

Agency Differences

On the whole, few differences between agencies were found. Planners' personal philosophies do not necessarily follow their agencies' priorities.

An "Ideal" Philosophy

A logical question raised by a study such as this is whether an "ideal" planning philosophy can be developed and used as a criterion to assess the potentialities of men to be planners. A primary attribute would be flexibility and willingness to accept new values. To prevent vacillation an individual should balance flexibility with confidence in his own ability, but be willing to accept the responsibility for his decisions. He should understand the nature of planning and the part it should play within society. Planners should believe in the rights of people, or their representatives, to influence plans which will affect their lives. A multidisciplinary education, with a major in water resource engineering, economics or ecology, and strong emphasis in the social sciences and law should provide a good, but not essential, background. Further exploration into attitudes might lead to the construction of an "aptitude test" for potential planners. An initial attempt at such a series of scales is shown in Appendix 5.

Further Research

There are several other areas for further research aimed at better understanding the planning process that has grown out of this study.

A similar survey should be repeated in four or five years to see whether current changes within agencies are reflected in a change in outlook by their planners and to assist in assessing the effectiveness of training programs.

Specific studies of four issues are needed. Are planners' goal structures and understanding of agency laws and policy actually as limited as this survey seems to indicate? How can planners acceptance of public participation be enhanced, and what methods of public input would provide planners with the most assistance? How are planners' attitudes actually translated into decisions? Planners' behavior in actual decision situations needs to be examined. On this last question, a case history approach is needed, tracing the effects of various individual decisions made throughout a project's development. A more defined set of scales with respect to nature should be developed since the general abstraction of "nature" was not found to be very predictive of attitudes toward specific features of the environment or opinions about an acceptable national policy.

It would be useful to compare the attitudes of federal, state and local planners. The State role in water planning is increasing and it would be interesting to know whether local planners have attitudes similar to federal level planners.

Similar surveys of planners in fields other than water resources might also be useful in understanding planners' attitudes and possibility in relating attitude patterns to education.

REVIEW OF PLANNING PROCEDURES

Environmental Planning

Planning objectives, as we used to set them, are no longer applicable. In watershed planning for instance, objectives used to mean "reducing flooding 70 percent," "three year level of protection," or "water supply and recreation for 'X' town," and that sort of thing. So for this discussion I am not using the term "objectives," but I am substituting the term "identification of environmental issues."

With this clarification, let me review briefly the planning process.

The first step consists of identifying the environmental issues -- all of them: What's out there?, fish and wildlife?, floodwater?, erosion? The needs of humans and of domestic animals, as well as the need for all other resource improvements. They must be identified.

Second, inventory the resources in the area to be planned. You must know what you have to work with. As far as human resources are concerned, the planner needs to determine who is going to do each task -- whether the individuals or agencies. This is a preliminary step in planning, subject to alteration. Nevertheless, the inventory should be prepared. For one thing, if resources of money, people, or agency help are not potentially available, the planner is alerted to the fact that a new approach is in order.

Third, there must be an evaluation. Each alternative must be measured in terms of gains or losses to the environmental issues under consideration. This will be a basis for decision-making.

The fourth step is the decision-making process based on an understanding of the environmental issues, the resources available, and the relative value of proposed measures. From this the planner can determine the total impact of the proposed project.

In effect, this becomes the environmental impact statement.

Question: What if the CEQ put your preliminary investigation and your environmental statement before you and asked you: Was this assessment and statement made "after the fact" - that is, after the planning is completed? Are you doing Environmental Planning?

Self Improvement

Have you updated yourself - Do you have a talk for SCS or non-SCS in which you get across the bases for planning? If not, I suggest you do something like I have listed below. Sponsors could be told in terms on updating from the old process to the new.

A. Review of the old planning process:

NOTE: Use slides and maps to show damages, land treatment, works of improvement, benefits, effectiveness in reduction of flood damages, need for control, water needs, and alternate methods of obtaining. Show how needs for channels are minimized. "Shoot for high level of protection with upstream reservoirs and low level of protection with channel improvement." Show old policy of maintaining fish and wildlife. Show adverse effects of planning channels for two or three year level of protection only with little other consideration.

B. New Process - Environmental planning to meet the objectives of the National Environmental Protection Act of 1969 (PL 91-190) and SCS policy and procedure Environmental Memorandum No. 1. State procedures of what to do and in what sequences the staffs will proceed.

1. Four steps of planning - use your own words and outline as I did earlier with you.

NOTE 1. Develop and hand-out worksheet as an example of identifying issues and considering environmental effects.

Exhibit 1

Exhibit 2

Adv. Env. 25 - assessment will replace these but the point is stressed - you need a way of telling leaders and sponsors what will be required.

NOTE 2. Different designs are a part of the inventory. Show sketches of channel improvement and other structural measures to include design and construction features. How can you assess without these?

Exhibit 3

NOTE 3. The ecosystem effects must be in consideration of the plants, soil, water, aesthetic values, fish, wildlife, domestic animals, health, agricultural production and human environment. Bring out the total concept of updating fish and wildlife to include food chain.

NOTE 4. Some discussion of investigations for example, how the hydrologist could study quality as well as quantity.

Environmental Development - outlined in the Ecology Course

In the Ecology course in Georgia, we had a discussion with class participation on procedures for environment development that ended in the following: For each ecosystem within the boundary, whether it be stream, flood plain, wooded area, crop land, or urban areas, study and describe.

FOR EACH ECOSYSTEM:

- I. Describe the environment - climate, geology, land use, social, hydrology.
- II. A. Structure - Species, numbers, important and unusual - (What's there?)
B. Function - Productivity, crops, forest, rivers, natural areas, turn over and rate of decomposition - how it works.
C. Development - history - changes over time - land uses, animals, organisms - trends.
- III. Linkage - This is the relationship of the ecosystems with inner-actions.
- IV. Man's desires -

Should you follow these procedures, they are like what we have been calling Environmental Planning. The important area that we have been missing has been the food chain. Since each "ecosystem equals groups of population plus environment," it seems to me in the past we have often gone overboard on fish and wildlife numbers. Also we have often been satisfied with describing a habitat from its physical characteristics.

Study for Facts

What is the function of a swamp? Is it an aesthetic experience, highly productive in organisms, corridor of movement of plants as well as animals, a giant kidney for cleaning rivers, recharger of ground water, an area for wildlife, an area for songbirds, and man made?

This whole paragraph was to ask you - will your procedures give you the answer - not a general statement - but the facts?

In general, sediment is not harmful to organisms. The critical area starts around 100 parts per million. Sand and silt in the stream bottoms has reduced habitats. Great velocity destroys organisms. A moving sand bed has very few organisms. Reducing high concentration of sediment and high velocity is beneficial to organisms.

Okay, now for the procedures - when you state a fact.

It is not enough to use our old format such as just writing a statement. We got to footnote it and say from whom or what study the fact was taken. I am sure every one of you have written an article for a Technical Society and you gave references. So it ought to be easy to make this change. Be sure in giving these facts that you have put boundaries on the ecosystem.

Work Outlines

Now with the number of studies and disciplines involved in the planning process, it is more important than ever that we concentrate on a watershed - complete it with minimum interruption and the way to do this is a strong work outline - scheduled and approved by the state conservationist. The overall major schedule items should be in the state APO. Anytime the planning staff is scheduled for other activities, the state conservationist should be notified of the change in the work outline - completion dates.

The Environmental Statement

To accomplish the objectives of the National Environmental Policy Act of 1969 (NEPA), an environmental statement is not prepared "after the fact", that is, after the planning for a program or projects completed.^{1/} The expected environmental consequences of the plan as it is finally recommended is set forth, of course. But, more important, there is a rigorous analysis of the environmental impact of each possible alternative at each step in the planning process. This leads the planner and the local sponsors in the direction of the alternative having the broadest range of beneficial effects with a minimum of adverse impacts. This is the true essence of NEPA, and the way we try to apply it in the Soil Conservation Service.^{2/}

The important point is that sponsoring local organizations retain responsibility for project development. Of course, SCS insists that alternatives be considered and that structural features finally agreed on are designed and installed in an environmentally acceptable manner. Adverse consequences must be avoided, compensated for, or mitigated. But measures that would enhance the natural environment for fish and wildlife, add recreational facilities, and the like, are not included unless desired and partially financed by the project's sponsors. From the moment a project is conceived until the final seeding is established on disturbed areas, and carrying on into operations and maintenance, environmental considerations are a part of the process.^{2/}

Keep in mind that the sponsors' job is the work plan and the SCS' job is the environmental statement. Thus, the importance of local sponsors and the SCS team working together in investigation, planning and using studies or reports by other state and federal agencies.

Many consultants, city planners, and state agencies are not fully understanding the responsibilities of the federal agencies concern for preparing environmental statements but are requesting more uniformity in the procedures and investigations. Their ideas range often from a two page form in which you would check yes or no or fill in blanks to generalized statements with no studies.

The Governor of Oklahoma requested the Regional Council in Dallas-Fort Worth to prepare an outline for all federal agencies to use. This request was given to the Environmental Quality Committee of the Dallas-Fort Worth Federal Executive Board. The product that has been prepared is attached and

1/ From Watershed Protection Handbook

2/ From: Joe Haas

again this is not a must for the states to use but as you follow a national guide, some of the phrases might be helpful to you. Note for example, flooding is only a related item under hydrological elements while zoological elements are much broader than our past fish and wildlife narratives.

In new projects let's:

1. Use the environmental planning process.
2. Make the necessary investigations.
3. Protect soil, water, plants, fish, wildlife, domestic animals, crops, pastures, and people.
4. Face the public with the proper assessment.

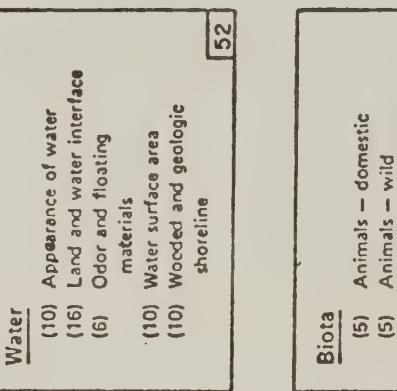
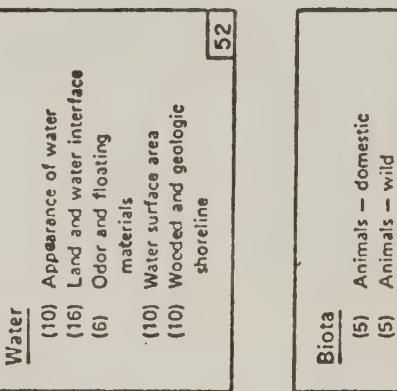
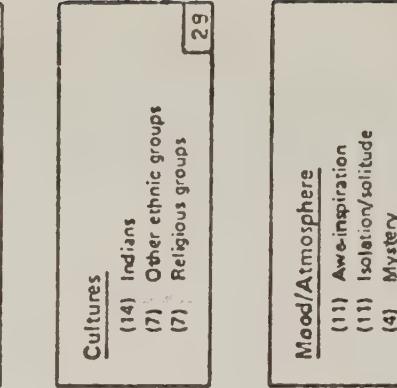
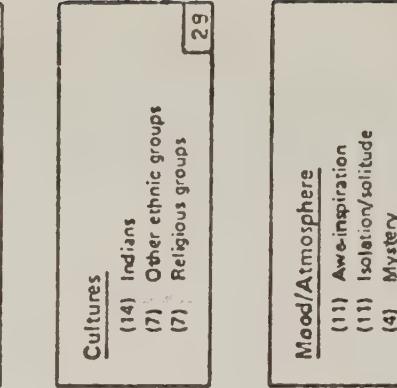
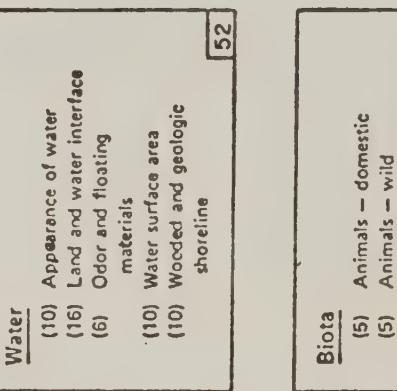
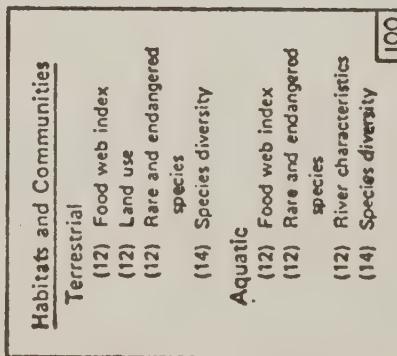
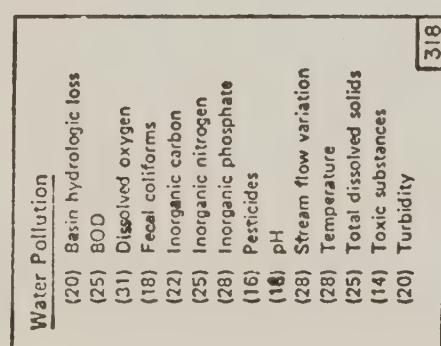
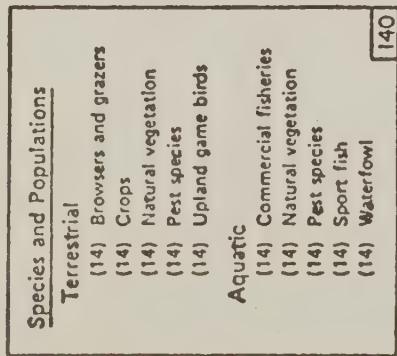
ENVIRONMENTAL IMPACTS

Ecology 240

Environmental Pollution 402

Esthetics 153

Human Interest 205



Legend
□ Parameter Importance Units
■ Total

FIGURE 1

ENVIRONMENTAL QUALITY PARAMETERS AND INDICATORS	UNIT OF MEASUREMENT	PRESENT CONDITION		FUTURE CONDITION WITHOUT PROJECT		ALTERNATIVE NUMBER ONE		ALTERNATIVE TWO		ALTERNATIVE THREE	
		Level	Rating	Level	Rating	Level	Rating	Level	Rating	Level	Rating
I. Physical & Chemical											
A. WATER											
(1) Dissolved Oxygen	Mg/l 1/										
(2) Inorganic Nitrogen	Mg/l 1/										
(3) Coliform Count	No./100 ML 1/										
(4) Inorganic Phosphate	Mg/l 1/										
(5) Pesticide Level	Mg/l 1/										
(6) Turbidity	(JTU) 2/										
(7) Sediment Load	PPM or Tons 1/	1500	3	2000	2	1200	3	1000	4	500	5
(8) pH	pH 1/										
(9) Algal Bloom	Species ⁶ Bigma	2000	3	1500	4	2200	3	2500	3	3000	2
(10) Physical Stream Characteristics	Length-No. of pools, rapids, marshes										
B. LAND											
(1) Erosion	Tons/Ac										
(2) Flood Plain Use											
(3) Compatability of Uses											
(4) Solid Waste Disposal	No. of Open Dumps										
C. AIR											
(1) Particulate Matter	PPM 1/										
II. Ecological											
A. SPECIES & POPULATION											
(1) Game Animal & Bird Population	No./Mi										
(2) Fish Species Pop.	No.										
(3) Rare & Endangered Species	Kind & Extent										
(4) Productive Plant Cover	Kind & Extent										
(5) Plant & Animal Pest Species	Kind & Extent										
B. HABITATS & COMMUNITIES											
(1) Animal Species Diversity	Kind-Nos.										
(2) Plant Species Diversity	Kind-Nos.										
(3) Land Use for Habitat	Kind-Ac										
(4) Fish Habitat (See IA-10)											
III. Aesthetic											
A. LAND											
(1) Geologic Relief											
(2) Land/Water Proportion	Ac Water/Ac total surface										
B. MAN MADE OBJECTS											
(1) Condition											
(2) Consonance W/Environ.											
IV. Social & Economic											
(1) Per Capita Income	Dollars										
(2) Area Per Cap/State Per Cap	Ratio										
(3) No. of Jobs-Retail Sector	Number										
(4) No. of Jobs-Serv. Sector	Number										
(5) Persons Displaced	Number										
(6) Health (See IIA-5)											

1/ Monthly Average

2/ Jackson Turbidity Level

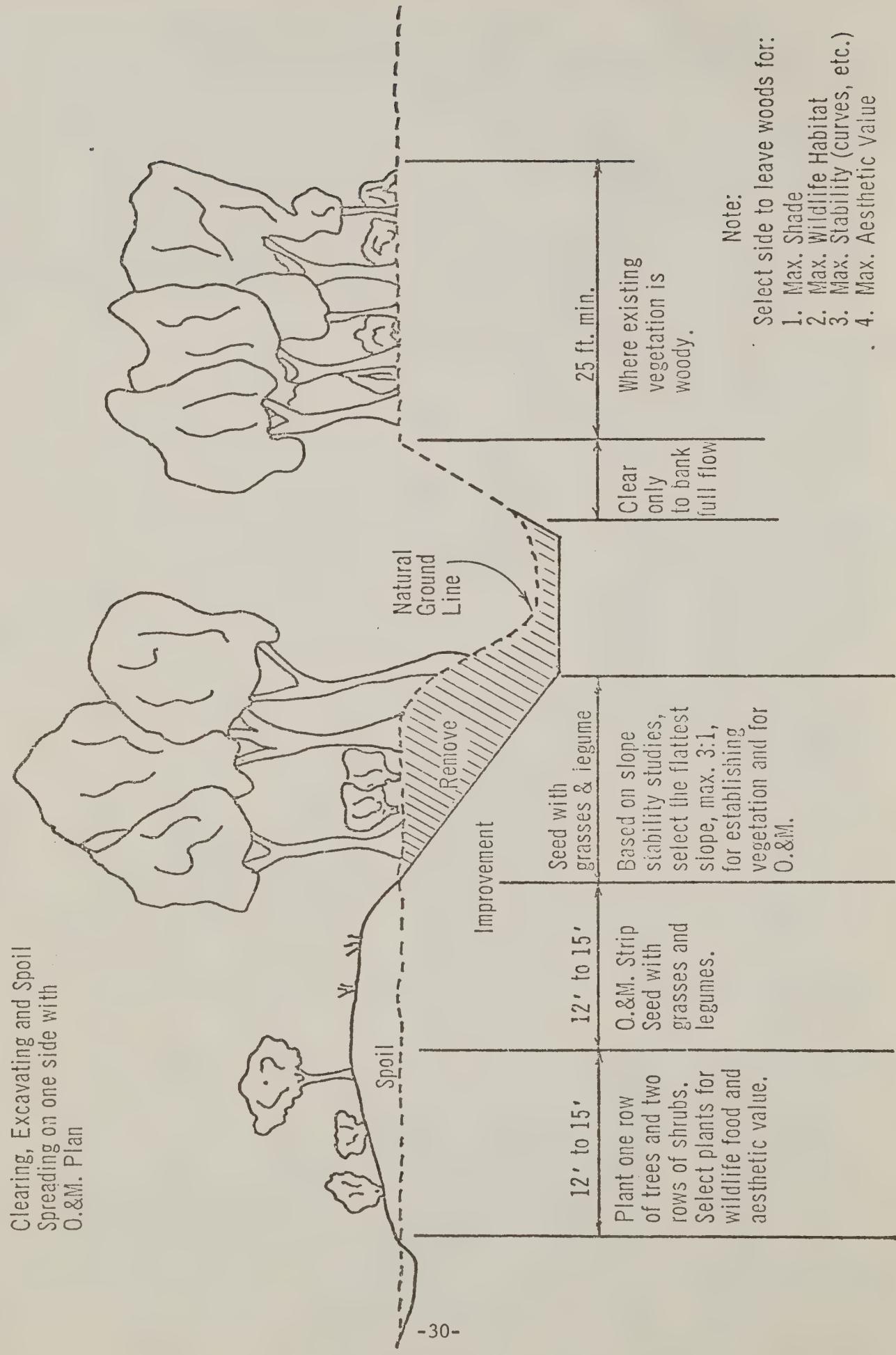
- Ratings
- 5 Ultimate
 - 4
 - 3 -29-
 - 2
 - 1 Unsatisfactory

NOTE:

These were handed out by SCS last year at our Environmental Planning EDU Course as a draft. It is now superceded by ENV-25.

Permanent Right-of-Way

Clearing, Excavating and Spoil
Spreading on one side with
O.&M. Plan



"Buzz Words"

Exciting	Consumers
Ecosystem	Production
Food chain	Respiration
Biogeochemical cycle	P/R
Population	Scramble
Cell	Disappearing species
Community	Rare (does not mean endangered)
<u>Species</u>	Holocoenotic (always within the whole)
Biota	Interacting
Succession	Energy
Diversity	Organism
Hierarchical	Models
Feed back	Copepod or whale
Carrying capacity	Population growth curve
Feral	Flux
Models	Predators
Sigmoid Curve	Attached algae (aufwuchs)
Niche	Detritus
Biomass	Enriched
Metabolic	Eutrophic
Stability	Structure, function, development, linkage
Producers	Acute and Chronic

"Match Words"

channel improvement	clear cut
PL566	channelization
You know	

SOUTHWEST FEDERAL REGIONAL COUNCIL

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MEMORANDUM

June 13, 1973

To : Heads of Federal Agencies, Region VI
Under Secretaries Group
Chairmen of Federal Regional Councils

Subject: Environmental Assessments (Suggested Guidelines)



The National Environmental Policy Act of 1969 enacted on January 1, 1970 and Executive Order 11514 dated March 5, 1970 require that all agencies of the federal government evaluate and control their activities, including grant programs, so as to protect and enhance the quality of the environment. Guidelines of the Council on Environmental Quality require that federal agencies, in consultation with other federal, state and local agencies, assess in detail the potential environmental impact in order that adverse effects are avoided and environmental quality is restored or enhanced to the fullest extent practicable.

As appropriate, federal agencies ask that applicants for certain federal grants develop an Environmental Assessment. This Assessment assists the agency in identifying and analyzing any environmental impact.

Representatives of some state agencies in Region VI have expressed concern over what they view as non-uniform approaches by federal agencies in obtaining Environmental Assessment information. Therefore, the Southwest Federal Regional Council felt the methods in use to develop Environmental Assessment information should be explored.

A form for capturing Environmental Assessment information is not desirable, even under the best of circumstances. On the other hand, it is of utmost importance that the federal agencies, to the extent practicable, use a uniform approach in achieving the development of such an important tool as the Environmental Assessment.

The Southwest Federal Regional Council has under study and consideration the attached draft of suggested guidelines for writing Environmental Assessments. In their development we used as a foundation the National Environmental Policy Act of 1969 (P.L. 91-190) and the regulations

Environment Workshop, Charlotte, North Carolina, August 28, 1973
by Jack W. Adair

thereunder established by the Council on Environmental Quality and published in the Federal Register of April 23, 1971.

We are at this time furnishing you an informational copy of the suggested guidelines. Any comments you may have can be addressed to the Southwest Federal Regional Council.



H. D. McMahan
Chairman

Attachment

SOUTHWEST FEDERAL REGIONAL COUNCIL

Guidelines for Writing Environmental Assessments

The Southwest Federal Regional Council, in cooperation with the Dallas-Fort Worth Federal Executive Board, developed these guidelines for writing environmental assessments. We have used as a foundation the National Environmental Policy Act of 1969 (P. L. 91-190) and the regulations thereunder established by the Council on Environmental Quality and published in the Federal Register of April 23, 1971.

The guidelines use a wastewater treatment facility as an example, but they can be readily changed in text for any type project or proposal. Each federal agency sponsoring projects or grants which require an environmental assessment may wish to supplement the Federal Regional Council's suggested guidelines wherein specific comments or the answers to specific questions are deemed necessary or desirable. In requesting additional information, the federal agencies are urged not to develop forms for state/local officials to use in making a response. The response should still be made pursuant to the headings in the Federal Regional Council's guidelines.

Developing an environmental assessment is a formal evaluation process for determining the effects of the impacts of any proposed federal action on the total environment. This process should consist of a thorough study of the existing and projected environmental conditions for identifying expected and potential impacts of the proposed action, as well as possible alternatives. Environmental surveys and data collection should coincide with engineering analyses so that the effects on the environment of the selected project and/or possible alternatives can be weighed objectively during the planning process.

The environmental assessment is one of the most important documents included in any management plan or grant application. It is the basis for judgment by the "responsible official" in his assessment of the proposed action, and can be entered as evidence in hearings and court actions. Therefore, it is of utmost importance that the assessment be a full disclosure document, giving the reader a clear picture of existing and projected environmental conditions, a complete but concise description of the proposed action, and an in-depth evaluation of possible impacts, both primary and secondary, which may be either beneficial or adverse.

Consideration should be given to developing the environmental assessment as a separate, self-contained document. It may be reviewed by readers who may never see the management plan, grant application, or the area on which it is written. The following detailed instruction, which includes the significant "Five Points" as set forth in the National Environmental Policy Act, outlines the major topics to be included in the environmental assessment.

1. Description of the Proposed Action

Describe the proposed action, its location, purposes and current status (if applicable), its time setting and inter-relationship with other projects or proposals. Generally describe the purpose of the project and what the plan entails. It is most important that the project be described in clear, concise layman's language. Technical specifications should not be included unless they are important for understanding the project. Include site plans, general layout plans and sketch drawings as appropriate. Discuss provisions taken and assurances made to insure compatibility with existing or future land use master plans, zoning ordinances and building codes. Include up-to-date maps depicting the existing and future land use plans and letters of assurance from planning officials or city or county officials.

2. Existing and Projected Environmental Conditions

This section is designed to give the reader an insight as to the conditions in the area where the action is to take place. This is very important because many readers of the assessment may not have any knowledge of the area. For many projects, inclusion of an area larger than the immediate project area (a watershed or river basin) may be necessary to prevent the possible omission of important facts critical to the overall assessment and evaluation. Include an up-to-date location or vicinity map with items such as hospitals, schools, residences, parks, etc., delineated thereon. The following items are some of the major environmental elements which should be addressed in the assessment:

- a. Geological elements - land forms (general topography of the area), rocks and mineral features, paleontology items (fossils), structures (faults, synclines), and other related elements such as soils, erosion, caves and aquifers.

b. Hydrological elements - natural lakes, reservoirs, estuaries, rivers, springs, marshes. Other related items as turbidity, pollutants (physical, biological and chemical), aquifer recharge areas, flooding.

c. Climatic elements - precipitation, temperature, freezing periods and prevailing winds.

d. Botanical elements - grasses, forbs, trees, shrubs, aquatic plants, microflora, unique species, seasonal color, mature stands of forest, vegetative zones and unique plant communities.

e. Zoological elements - mammals, birds, amphibians, arthropods, fish, shell fish, microfauna, migration routes, breeding areas and endangered species.

f. Archaeological/historical/cultural elements - ruins, artifacts sites, ghost towns, battlefields, cemetaries, scientific areas and scenic areas.

g. Economic conditions/social relationship/human well-being - population trends, settlement, educational resources, employment, land values, taxation, economic trends, health aspects, aesthetics.

h. Miscellaneous elements - national parks or forests, wildlife refuges and management areas, contemporary human features (buildings, transportation systems, etc.), fishing and hunting clubs, and parks or recreation areas.

i. An in-depth discussion of the needs of the project area. Items that would improve the quality of the environment (waste water treatment, solid waste treatment, roads, parks, zoning ordinances, building codes, land use regulations) should be discussed. The need for the proposed action should be presented in such a manner that it could not be construed as a "project justification statement."

j. Programs of other federal, state, local and private individuals in the area - highways, airports, housing developments, industrial development, parks and playgrounds.

k. Expected future activities such as population growth, industrial and land use changes, and their impacts.

3. Environmental Impact of the Proposed Action

In this section describe the primary and secondary impacts, both beneficial and adverse, anticipated from the proposed action on the items listed in Section 2. The scope of this discussion will include both short- and long-term impacts. Some examples of expected impacts for a wastewater treatment facility are as follows:

- a. Removal of present odor at an overloaded plant.
- b. Land use changes, siting problems.
- c. Home and business relocation.
- d. Description of traffic patterns during construction.
- e. Effect on stream uses, such as improved fishery habitat by increasing DO in a given stream, reduced sludge, aquatic plant growth, recreation, suitability for water supply, etc. Also, an in-depth discussion of standards or effluent limitations should be included.
- f. Air, water, noise pollution during construction and their reduction once the project is in operation.
- g. Archaeological, historical or cultural sites which may be destroyed by construction.
- h. Loss or altered wildlife habitat, regardless how small the area involved.

Also, identify any remedial, protective or mitigation measures which will be taken as a part of the project to eliminate or compensate for any detrimental aspect of the project. This includes such items as plantings to enhance the appearance of the treatment plant, erosion control measures during construction and alternative methods of disposal of trees, brush and buildings which must be removed for construction of the project. Where abatement measures can reduce adverse impacts to acceptable levels, the basis for considering these levels adequate and the effectiveness and costs of the abatement measures shall be specified. An example of this could be tree and shrub plantings to enhance the appearance of a treatment plant, but this effort will not eliminate other impacts imposed by the project.

The above-listed items are but a few of the elements which may or may not be affected by a given project. It should be kept in mind that the intent of the National Environmental Policy Act is to permit the decision-maker to have all of the facts before a decision is made. Unless the writer of an environmental assessment puts such information in his report, the decision-maker will be operating on biased or limited material. The fact that a given project may involve or even destroy some element of the environment does not mean that the project should not or cannot be built. However, if the subject is not surfaced and discussed in the assessment, it could lead to possible court action, extended delays and embarrassment to federal, state and local interest.

4. Adverse Impacts Which Cannot be Avoided should the Proposal be Implemented

The adverse impacts surfaced in Section 3 should be discussed further in this section. These are impacts which cannot be reduced in severity or can be reduced to an acceptable level, but not eliminated. For those which cannot be reduced, such as loss of wildlife habitat and relocations, their implications and the reasons why the action is being taken, notwithstanding their effects, shall be described in detail. In particular, this analysis shall detail the aesthetically or culturally valuable surroundings, human health, standards of living or environmental goals set forth in Section 101(b) of the National Environmental Policy Act which would be sacrificed. Also, it shall describe the parties affected (including any minority communities) and any objection raised by them. Include a statement on relocation of persons, if required by the proposed project.

5. Alternatives to the Proposed Action

Develop, describe and objectively weigh alternatives to any proposed action which involves significant tradeoffs among the uses of available environmental resources. The analysis shall be structured in a manner which allows comparisons of (1) environmental and financial cost differences among equally effective alternatives, or (2) differences in effectiveness among equally costly alternatives. This presentation should be equal in quality and detail to that of the proposed action, particularly for the sections on Description, Impacts (primary, secondary, beneficial and adverse), Relationship Between Local Short-term Uses of Man's Environment and the Maintenance and Enhancement of Long-term Productivity, and Irreversible and

Irretrievable Commitments of Resources Which Would Be Involved in the Proposed Action, Should It Be Implemented. Where practicable, benefits and costs should be quantified or else described qualitatively in a way which will aid in a more objective judgment of their value. Where such an analysis is prepared, it is suggested that it be appended to the assessment. The analysis of different courses of action shall include alternatives capable of substantially reducing or eliminating any adverse impacts, even at the expense of reduced project objectives. The specific alternative of taking no action always must be evaluated. This analysis shall evaluate alternatives in such a manner that reviewers independently can judge their relative desirability. In addition, the reasons why the proposed action is believed by the agency to be the best course of action shall be explained.

6. Relationship Between Local Short-term Uses of Man's Environment and the Maintenance and Enhancement of Long-term Productivity

Describe the cumulative and long-term effects of the proposed action which either significantly reduce or enhance the state of the environment for future generations. In particular, the desirability of the proposed actions shall be weighed to guard against short-sighted foreclosure of future options or needs. Special attention shall be given to effects which narrow the range of beneficial uses of the environment or pose long-term risks to health or safety. Who is paying the "environmental cost" versus who is gaining the "benefits" over time shall be identified. In addition, the reasons the proposed action is believed to be justified now, rather than reserving a long-term option for other alternatives, including no use, shall be explained.

7. Irreversible and Irretrievable Commitments of Resources Which Would Be Involved in the Proposed Action, Should It Be Implemented

Describe the extent to which the proposed action curtails the diversity and range of beneficial uses of the environment. Uses of renewable and non-renewable resources during the initial and continued phases of the action shall be specified. In this regard, construction and facility uses are basically irreversible since a large commitment of resources makes removal or non-use thereafter unlikely. Such primary impacts and, particularly, secondary impacts (e.g., opening areas to further development) generally commit future generations

Investigations Related to Plant Science 1/

The main reason for inventories is for an adequate profile of the existing conditions where you can have realistic projection of your base information whether it be for no project or a number of varying alternatives. We need an objective recording of the basic resources. The interdisciplinary approach should iron out any bias by specialties. As an example, you may have a higher value on recreation if done by a sports fan than is actually the impact. If collective judgment is made, you should have a realistic rating.

All data collected should be compiled where planners, decision-makers, or those preparing environmental impact statements can make the same assessment of the data. It needs to be complete to the point you have the information that is available or you know additional information is needed. If appropriate data are not available, it will be necessary to take steps to get it. We have not actually used the information we have available to the extent needed. We need to use the accepted informational sources but in many cases we need to search further. We have not made full use of outside sources of information and in many cases we have not used information that was available under the same roof in assembling data for assessment.

As an example, nitrogen has been traced through systems analysis and found only about 4 parts per million that percolates into the ground water from nitrogen fertilizer (N-15). While fertilizer (N) increased greatly over a 30-year period (35 to 100 times), the nitrate load on the Upper Rio Grande was not increased in a study by ARS scientists C. A. Bower and L. V. Wilcox. The same was found to be true on the Kaskaskia River in Illinois by Dr. Aldrich. There is abundant proof that whatever extent fertilizers contribute to bad water, the pollution results from erosion rather than leaching or percolation - 97 percent of the phosphorus that is lost from agricultural land is due to erosion.

The area of influence of a proposed watershed project may extend beyond the hydrologic boundaries; therefore, we need to look at broader areas and be sure we have the available inventory information that is needed to consider all alternatives.

Ian L. McHarg in his book, *Design with Nature*, describes an evaluation method whereby absolute economic values are abandoned that cover only a small range of price values, and using a relative system of most to least, whereby it is possible to include all the important factors that defy pricing by economists. Not enough is known of this system to say, but it seems to have arbitrary connotations, and some of the uncertainties found in assigning market values.

Whether you accept Barry Commoners' estimate that under present conditions the earth can hold between 6 and 8 billion people before environmental

and food supply problems become insurmountable, or the projections of the British Physicist, J. H. Fremlin, who thinks the world could support - feed and house - an ultimate capacity of sixty million, billion people, depends on your belief in the capacity of man to utilize knowledge and earth resources to perpetuate himself. Other estimates have been made such as that of DeWit who calculated the earth's supportive capacity to be 146 billion. Dr. Colin Clark, the eminent British economist, has calculated a capacity of 35 billion, or ten times the present population. His calculations were based on supporting this population at a standard equal to that enjoyed in the United States, by using present technology on a world-wide scale on all arable land in the humid temperate climate. He did not make allowance for improvement in technology or food from the sea.

Commoners' estimates place the danger level at two times present population. Fremlin's estimate is 17 million times the present world population. None of the predictions indicate that famine is imminent or that it is inevitable.

These extreme ranges in estimating carrying capacity are brought to your attention to illustrate the speculative nature of estimates made by men with different scientific backgrounds, but with the same information available from which to draw a conclusion. The conclusions are sincere, but cannot always be considered rational. Obvious data are ignored which reminds one of the poem, "The Perfect Reactionary" by Hugh Mearns:

As I was sitting in my chair
I knew the bottom wasn't there.
Nor legs nor back, but I just sat,
Ignoring little things like that.

The following guidelines are for use in developing basic data and interpretive maps.

Examples of Considerations for All Land Uses are:

Kind of Erosion

Flood Hazard

Deposition

Water

Wind

Streambank Erosion

Floodplain Scour

Wetland

Rare and/or Endangered Species by Name and Location Based on Accepted List for the State

Weedy Species by Name and Location

Other Examples of Indicators for Use by Specific Land Use:

Cropland - Crop management system, production potential, land used within capabilities, drainage.

Pastureland - Pasture management system, production potential.

Rangeland - Condition class, woody plants, poisonous plants.

Recreationland - Land used within soil limitations or designs to overcome limitations, depth to seasonal water table.

Urbanland - Same as recreationland.

Wildlifeland - Wildlife management systems.

Woodland - Suitability, species, composition, stocking size and age - forage production.

Other Lands - For example - surface-mined land - potential for forage production, crop production or tree production when properly treated - stabilized, revegetated, sediment control.

Description of Area (Major Plant Communities)

Indicators	Unit	Present	No Project	Alt. 1	Alt. 2	Etc.
Cropland						
a.						
b.						
Pastureland						
a.						
b.						
c.						
Rangeland						
a.						
b.						
c.						
Recreationland						
a.						
b.						
Urbanland						
a.						
b.						
Wildlifeland						
a.						
b.						
c.						
Woodland						
a.						
b.						
c.						
Other Land Uses <u>1/</u> Such as Wetland <u>2/</u> or Mined Land						

1/ Name the use.

2/ Classify Wetlands by Category and Type as per U. S. Fish and Wildlife Service Circular 39.

Flood Hazard - For Cropping

A. Not Subject to Flooding

B. Subject to Flooding but not in Excess of Selected Crop Tolerances

Grain sorghum where too wet for corn.

Forage sorghum for silage.

Bermudagrass for protein where too wet for alfalfa or other well drained protein producing plants.

C. Too Wet to Manage Unless Protected or Drained

Guidelines for Assigning Quality Levels (Need to be Tailored for Local Conditions)

Degree and Kind of Erosion
In Tons Per Acre Per Year

	Unit Acres	Present	No Project	Alt. 1	Alt. 2	Etc.
A. No evidence of erosion (less than one ton per acre soil loss).						
B. Slight evidence of active erosion but within tolerance of soil loss per acre.						
C. Active areas of sheet, gully, rill or wind erosion. Soil loss in excess of 20 tons per acre.						
D. Critical areas of deep gullies and/or loss of surface layer. Loss in excess of 40 tons per acre.						

Biology

Guide to Identifying Gains and Losses

1. The following guides are available with numerical ratings described:
 - a. Measuring the mile-value of stream habitat (water and channel).
 - b. Measuring the acre-value of marsh and wetland habitat.
 - c. Measuring the acre-value of lakes and ponds as fish habitat.
 - d. Measuring the acre-value of woody habitat (trees, shrubs, vines).
 - e. Measuring the acre-value of grassy habitat (grass, forbs).
 - f. Measuring acre-value of farm crops.
2. Fish migrations should be added where applicable.

WOODLAND INVENTORIES

- A. Where forests are present, describe the resource by location and extent using the following criteria:
1. Cover type -- follow the guidelines given in "Forest Cover Types of North America," published by the Society of American Foresters, 1010 Sixteenth Street NW, Washington, D. C. 20036. Show the cover type both by number and name.
 2. Age and size class -- most forests, but not all, are essentially even-aged. The approximate age and diameter range of the trees making up the upper canopy should be shown.
 3. Productivity -- show productivity by site index referenced to a particular woodcrop. The reference age should be indicated. Generally but not always, for southern trees the reference age for site index is 50 years. Productivity can be approximated from soil surveys.
 4. Condition of growing stock -- some indication should be given of the level of quality of the trees for wood-growing purposes.
 5. Aesthetic values --
 - (a) The presence of very large or very old trees or the presence of uncommon or rare species or the presence of endangered species should be indicated.

Very large trees should be documented as to specific location and the vital measurements of diameter (or circumference), total height, and crown spread should be recorded. These might best be placed in perspective by comparing the measurements of the trees in question to those of the same species which have been recognized in the Social Register of Big Trees maintained by the American Forestry Association or similar registers maintained by individual states.
 - (b) Trees which have unusual shape or form or which have unique historical significance should be recognized.
- B. Where significant change is to be made in cover type, age, and/or size class, productivity, growing stock condition or aesthetic values, describe the change quantitatively or qualitatively, or both.

TYPE OF SURVEYS NEEDED ON RANGELANDS WITHIN A WATERSHED
AS SUPPORTIVE DATA FOR THE PREPARATION OF ENVIRONMENTAL STATEMENTS

1. Range site and condition class surveys

The kinds of information to be obtained from a range site and condition class survey are:

- a. Acreages and location of the different kinds of rangeland within a watershed.
- b. The present and potential plant communities which can be interpreted into forage for domestic animals and wildlife habitat.
- c. Extent and location of areas that have a potential for conversion to other land uses.
- d. Location and extent of areas that need special treatment to protect them from erosion or further deterioration or to improve their productivity.
- e. Location of areas that have been classified as having unusual aesthetic values.
- f. Locate and document rare and endangered species found on rangelands.
- g. Location and densities of woody species that require special treatment or management.

OTHER INVESTIGATIONS

Several points made here earlier this morning are worthy of reemphasis in providing a background for discussion of "other investigations". The first of these is reflected in the word responsibility. Quality in Service environmental statements is a shared responsibility. Employees at every level of our organization must commit themselves to this end, if quality is to be improved.

The second is flexibility. Responsiveness of the overall planning effort during project development demands that Service guidelines remain as flexible as possible. Flexibility is also important in our attitudes to remove inherent biases in our traditional approaches to a job.

A third and final point is that the key to further improvement in Service environmental statements rests in improving our environmental planning processes. Guidelines which have evolved since the passage of NEPA, although used extensively in guiding the preparation of environmental statements, appear to have received little recognition as a catalyst for change in the planning process. Many of our current plans and statements reflect that we have followed the "recipe" provided by our guidelines too closely, with little attention to the "ingredients" going into the mixer -- namely, objectives, inventories and evaluations.

To make the improvements needed in Service environmental statements demands that we, both individually and collectively, further our understanding of the environment and of the environmental planning process. We must strengthen our capabilities in identifying those investigations needed for meaningful decisions. To do this we must develop the ability to question our own actions to reaffirm the following:

1. What it is we are hoping to accomplish through the planning process (objectives).
2. Whether we have established a narrow program objective prematurely, without first considering broad resource objectives.
3. What inventories and evaluations are needed as a basis for sound environmental decisions.

Presented by R. Douglas Peet at the Environmental Statement Workshop held at Charlotte, North Carolina, August 29-31, 1973.

The word "investigations" in the planning process includes both inventories and evaluations. Inventories, as was discussed earlier, are intended to provide a profile of existing conditions upon which projections of the future, both with and without the project, can be based. Inventories may be description oriented (resource inventories), problem oriented (problem and needs inventories, or development oriented (inventories of resource potentials.

Evaluations which accompany the planning process are primarily oriented toward making comparisons (alternatives) and establishing interrelationships (linkages). The comparisons we make under environmental planning concepts cover alternatives within a program as well as between programs. Comparisons between programs normally take the form of alternate objectives, and those within a program, alternate treatment measures.

The following list reflects many of the inventories and evaluations needed during the environmental planning process in the course of developing a watershed project plan. You can see the list is organized by specialties. The list is not all-inclusive, nor will all items apply to all projects. You may find some duplications of listed items between specialties.

Economics

Agriculture Economy

- Number and size of farms
- Economic classes of farms
- Value of products sold - present and future
- Numbers of full and part time farmers
- Yields - present and future
- Trends in agricultural production
- Crop budgets
- Flood plain use and production
- Land use changes

General Economic Conditions

- Employment
- Urban income
- Business activity
- Manufacture
- Mineral
- Transportation facilities
- Tax base
- Non-agricultural economic trends

Other Inventories

Cost of municipal water supplies
Cost of sewage treatment
Cost of industrial waste disposal
Vector control
Cost of replacement for fish killed
Values of fishing, hunting, and recreation
Economic impact of migration
Tax base
Effects of nuisance-type flooding on values of real estate

Hydrology

Water Quality

Pollution problems
Suitability for use for
 M&I
 Recreation
 Wildlife
Chemical content
Temperature
Turbidity
Color
Odor
Suspended solids
pH

Analyses

Hydrographs and stages downstream from project
Water surface profiles
Hydrograph shapes
Discharge stages (tabular presentation)
Changes in stage, area flooded, and damages
Frequency of flooding and damage
Description of past floods
Type of streamflow
Hydrologic conditions in watershed
Potential of zoning and flood proofing
Bridge and culvert capacities
Structure discharge rates
Effects of urban development

Discussion of project

- Effect of land treatment measures
- Effect of structural measures
- Level of protection - Urban and other
- Effect on specific past floods
- Discuss alternatives, such as
 - Conservation land treatment alone
 - Floodplain land use conversion
 - Floodproofing and floodplain zoning
 - Floodwater retarding structures alone (in various combinations)
 - Channel work alone
 - Combinations of retarding structures and channel work
 - Changes in project objectives
 - No project action
- Numbers of farms and other benefiting
- Identify areas subject to flooding after project
- Water losses

Recreation and Fish and Wildlife

Landscape analysis

- Vegetative - trees, shrubs, and other
- Channel alignments
- Composition

Biological analysis

- Water temperatures
- Water quality
- Wildlife inventories
- Description of estuarines
- Fish production

Recreation

- Inventory facilities available
- Inventory potential
- Determine recreation foregone by project development
- Study state plans
- Select recreation measures
 - Evaluate use and benefits
 - Determine facilities replaced
 - Determine favorable and adverse impacts

Geology

Ground Water

 Recharge
 Ground water levels
 Quality

Channel

 Bed
 Banks

Structure Site

 Foundation
 Environmental aspects

Erosion and Sedimentation

Gross Erosion - Physical and Environmental

 Land loss
 Stream bank

Sedimentation

 Water quality

 Water supply
 Recreation

Deposition

 Flood plain
 Channels
 Swamping

Sediment yield (quantitative - mg/l)

Downstream Effects

 Turbidity
 Other sediment

Waste Management-Sanitary Landfill

 Foundation material
 Pollution potential

Historical and Archaeological Areas and Rare and Unique Geological
Features
Classification of Stream and Valley Environment

Irrigation

In addition to many of the items listed under the above headings, the following items should be investigated, described, and evaluated in planning and developing the environmental impact statement when irrigation is involved.

Water Quality

Parameters to include

Dissolved solids
Specific conductance - EC x 10^6
Sodium absorption ratio (SAR)

Suitability for irrigation with respect to
Crops to be grown
Soils

Water Losses

Present or potential due to

Seepage and evaporation from project distribution systems
Seepage and evaporation from on farm distribution systems
Application inefficiencies
Leaching requirements to maintain salinity balance

Measures to control water losses within acceptable limits
Project - pipelines, canal liners, return flow systems, etc.
Land treatment - pipelines, land leveling, irrigation and drainage systems, tailwater recovery systems, management, etc.

Erosion and/or Sedimentation

Present or potential due to

Installation of project measures
On farm irrigation applications
Measures to control erosion within acceptable limits
Project
Land treatment

Effects

Changes in land use due to irrigation
Changes in cropping trends and yields due to irrigation
Intensification and acceleration of land treatment measures
needed to obtain field irrigation efficiencies and project
efficiencies established for project formulation.

In conclusion, let us keep in mind that an environmental statement is a window into a project. If properly prepared, the statement will mirror the thought processes used in planning, whether good or bad. To a substantial degree, therefore, a statement will be our strongest defense of a project or its weakest link.

An example of this is provided in a recent environmental statement which came into the RTSC for review. In the environmental setting section of the statement, we were told that the topography of the area was for the most part characterized as a "deeply dissected hilly upland". Later, under the problems heading we learned that should need develop in future years for M&I water supply, "adequate sites were available". Yet we found the planned project provided for only five structures of modest size and 29 miles of channel work to reduce floodwater damages. An examination of structures ceased essentially with the five contained in the plan, which, without the channel, produced a B-C ratio in excess of 2:0:1.0. A further example was provided in the same statement where 4 miles of the planned 29 miles of channel work were shown to produce no hydrologic effect, although included in the project for reduction of floodwater damage.

Can we in the Service feel that we have adequately inventoried the potentials for floodwater retardation in a project, through a consideration of only five sites in an area of deeply dissected topography? Can we rationalize the inclusion of 4 miles of channel work with no hydrologic effect to achieve damage reduction from floodwater, even though the planned work may cause little disruption to plant and animal communities? These are the types of questions each of us must ask.

RECREATION IN ENVIRONMENTAL IMPACTS

In environmental planning, recreational use of land and resources is assumed by many planners to be relatively free of adverse impacts. Recreational land use planning is related to the disciplines in an "environmental" group of recreation, landscape architecture, fish and wildlife, perhaps forestry and others.

There seems to be ample evidence that some recreation is necessary to human welfare although the kinds and amounts are subject to much discussion. There are many persons, both technical and a large group of recreation-environment oriented laymen, who champion perservation or creation of wilderness, wildlife, and recreation areas. It is a popular subject, yet one frequently apt to be championed by an enthusiastic and biased constituency. In fairness, we should recognize the bias of other persons, groups, constituencies for using land and resources for other purposes - urban development, highways, crops, grazing land, etc. It appears an unbiased planner must consider all land use alternatives on their own merit.

Toward this end, some of the favorable and adverse impacts are listed below. In reviewing the comments about draft environmental statements, one can see many comments about land management, economics, and perhaps other comments which appear to be indirectly related to the impacts on the environment. However, since it is not the purpose here to establish the degree or closeness of the relationship of, say, economic impacts and physical impacts, rather indirect relationships may be included.

Landscape impacts - Recreation developments often do not adversely effect the environment and may enhance it. However, recreation developments may have adverse impacts on landscape colors, textures, patterns, forms, etc. Lakeshore housing developments with little care for preserving shoreline trees, docks, etc., can be a usual blight. Cabins or other buildings in parks may have roofs of colors clashing with the environment where "earth" colors of greens and browns would have been desirable. Roads and utility poles or rights-of-way and channel may slash across landscapes where they could have been buried in the case of lines, aligned with natural contours in the case of roads, followed a modified natural alignment of streams in the case of channels, or been concealed with vegetation either preserved or planted.

Air and water quality - Recreation developments may disurb nature vegetation with construction, could cause erosion (70 percent of state parks and significant erosion in one study) by compaction and loss of vegetation from traffic. Concentrating people concentrates waste which may cause some degradation of water quality from effluents, even

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well-processed sewage may add nutrients at least, a form of water quality degradation. Dust (air contaminant), is a common problem. Burning of trash, even cooking fires, may add some particulates to the air. Except for the problem of sewage disposal, degradation of air and water quality by recreation developments is usually a minor impact.

Economics - Recreation provides positive values of both income and the satisfaction of needs. Few reviewers, if any, have questioned that values occur. But many reviewers raise questions primarily about procedures in documenting values, calculating values etc.

Recreational use of land may be in competition with other uses such as crops, or perhaps in competition for a lesser degree of development e.g. recreational reservoirs vs. the free flowing stream.

Several comments have been seen in which the reviewer believed that the benefits foregone from the former use should be deducted from benefits for the planned use. A common example of comment is that the values of the stream fishery (or stream-fishing activity) should be deducted from the recreational value of reservoirs. If this is permitted, then it might appear logical to do this for every land use or resource use change for consistency. For example, would not an economist deduct the value of cropland inundated from the benefits of the reservoir, perhaps cropland values from the acreage converted to pasture, perhaps even the values of projects foregone from the values of land uses in the proposed project area? Truly, a Pandora's box of complications. One strong point seems to emerge - why single out some values and not others. Should not the treatment be uniform?

The calculation of future recreation demand and needs in water resource projects should be carefully assayed. Procedures are rather crude and often not reliable. Projections of future demand in some river basin studies show a large amount of land or other resources that will be needed. A common sense look indicates that this amount of resources cannot be dedicated to recreation in view of needs for food, fiber, wood, and other products. These demand projects need to be treated in much greater detail. Better inventories, design and use standards, etc. are needed to support either proponents or detractors of recreation land use since the present state of the art is rather inconclusive.

Soils - Recreational use of land may cause compaction, saturation with nutrients or effluents, clogging of soil "pores" with organic detritus from waste disposal systems, erosion. The capacity of soils to withstand recreational traffic is not well documented, the art at present may not yield conclusive estimates. However, severe damage to the environment could occur due to recreational use.

GEOLOGIC INVESTIGATIONS
FOR
WORK PLAN AND ENVIRONMENTAL STATEMENT DEVELOPMENT

The preparation of Environmental Statements requires inputs to the planning effort from the beginning of the planning process. To meet the needs for acquiring the data necessary for preparing comprehensive and adequate Environmental Statements, expansion of most of the current items of investigation and some new items is necessary.

The following items which may not be all inclusive, should be considered in gathering information and data for practically all watershed work plan preparation. Prior to now, some plans involved some items and other plans may have involved these same items or different ones. Henceforth, most of these items should be considered in every plan in order to adequately assess the existing environmental setting and the potential impact of projected changes without and with project action.

I. Ground Water

- A. Recharge - Consider the current recharge and the potential changes, if any. State and Federal agencies, such as USGS and State geological surveys, usually have published information or studies underway which will help in this analysis. If not, they will usually provide an opinion if they are asked to do so.
- B. Ground water levels - In watersheds where channel work is included in a project plan, one question asked by reviewers is: "What will the channel work do to the ground water level?" The geologist should answer this in the plan.
- C. Ground water quality - Most areas in this country have published reports on current ground water quality. An attempt should be made to determine project effects on this quality and the results should be documented.

II. Channel Investigations

If a project will affect the stream flow regime (either by stream flow changes or physical channel changes), the effect of these changes on the banks and bed should be analyzed. The results of these analyses will indicate the impact on aesthetic values and on fish and wildlife.

III. Structure Site Investigations

Normally site selection is based on optimum physical adequacy;

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environmental setting also should enter the selection process. This can be accomplished concurrently with other standard investigations.

IV. Erosion and Sedimentation

- A. Gross Erosion - In addition to the computation of soil loss, the environmental effect of land destruction and channel bank changes should be evaluated and documented.
- B. Sedimentation - This is a standard investigation item that needs some expansion.
 - 1. Deposition on the flood plain can cause channel filling, swamping and other damages such as damages to agricultural production and cultural developments. Environmentally, these effects can be of varying significance. Are they aesthetically damaging and, if so, how? Is the quality of water supplies for the various consumptive uses and/or nonconsumptive use such as recreation being degraded by sediment? Quantify watershed sediment yield in milligrams per liter (mg/l).

V. Downstream Effects

This is one of the most frequently controversial items. Are turbidity and bedload sediment increased in downstream areas by installation of project measures? Every method available and all existing avenues of obtaining pertinent data should be employed in attempting determining downstream significance of potential changes.

VI. Waste Management

RC&D project measures may include sanitary landfill. Investigations of foundation conditions should be performed to determine construction suitability and to determine surface and ground water pollution potential. This is required by state law in some areas.

- VII. Historic, archeologic and rare and unique geologic features are items that are frequently overlooked or given little attention. If the investigation brings one or more of these items to light, the plan presentation can be improved significantly. If there is no evidence of their existence, this should be documented.

VIII. Classification of Stream and Valley Environments

Advisory ENG-19, June 6, 1973, transmitted a draft of "Geology As Applied to Environmental Problems Encountered by SCS." Item C, 3 - Preservation or Improvement of Environmental Values and Aesthetics discussed items for environmental consideration. Under

this heading, Item a, "Stream and Valley Environments" gives guidance in making choices among alternative sites for preservation, development and restoration. This discussion refers to a classification system for stream and valley environments which has been given to all geologists in the SRTSC area. This classification provides a method to evaluate environmental aspects of streams and valleys with which SCS may be concerned.

SUGGESTIONS FOR ECONOMISTS IN WATERSHED PLANNING

Advisory WS-26, dated June 25, 1973, sets forth some guidelines for preparation of Environmental Statements. To prepare such statements attention needs to be given to obtaining the necessary data at the start of planning. The purpose of this statement is to give some suggestions for consideration by the economist in meeting his responsibilities. Some of these items may not be appropriate for a given watershed. In other watersheds, additional avenues of exploration may be pertinent.

Meeting the needs for acquiring data to prepare good Environmental Statements will require expanded efforts by the economist in most cases. Research reports and papers, reports of public agencies will need to be referenced by footnotes. Often consultation with universities will give access to information that has not yet been published or is back-up material for published reports. Footnotes should show this as unpublished data collected by the appropriate agency. The development of other material collected by the economist in the course of his investigations can be described in the Investigations and Analysis section of the work plan. Examples of this might be exploration of the taxing rate with county authorities, problems and costs in treating water from the water supply people, etc.

Environmental Setting

Many of the physical elements in a region have a direct effect on the people there, in terms of health, economic well-being, or satisfaction with life. Unless these are brought out there is a tendency for them to be overlooked. This general field of inquiry is a proper function of the economist.

Agricultural Economy -

Material is available in the Census to show numbers and sizes of farms. The Census also provides data on farms by economic classes, value of products sold, value of farms, numbers of part-time and residential farms. Comparison of the latest census with preceding ones will indicate trends in these items as an indicator of conditions which may exist in the future without project. Although Census data is not broken out for smaller political units than counties or parishes for agriculture, changes induced by a project will have economic impacts on the surrounding areas so the county data will be pertinent.

Most work plans contain some information of these types gleaned from the Census but often not all relevant aspects have been considered.

The Census is not necessarily a good indicator of current yields. The years covered by Census information may have been unusually good or bad years due to vagaries of the weather, insect infestation, etc. When

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work unit Technical Guides are kept current, good local information on yields and production practices can be obtained from them. Local ASCS offices also may have information on normal yields of allotment crops. Most State Universities will have data on crop budgets. The District Conservationist and County Agent also should be excellent sources of data. ERS publications 457 and 461, "Selected U. S. Crop Budgets-Yields, Inputs, and Variable Costs," for the Southeast and South Central Regions, respectively, contain generalized information as of April 1971. It is believed that copies of this publication have been sent to all States. The economist in the course of his normal studies will pick up information on the flood plain, on areas where inadequately drained versus drained lands are concerned, and on responses to irrigation. Recourse should be had to agronomists and other specialists as to what may be expected in the future without project action but only on-going programs in effect. Chapter 15 of the Economics Guide will provide ideas here.

Although an economic evaluation of the effects of conservation treatment is not made for purposes of project justification, it would seem appropriate to analyze the present and future agricultural production and income of the watershed with only the going programs operative. Only by doing this and then following it with a similar analysis with proposed project can the impact of the project upon the agricultural sector be evaluated.

General Economic Data -

In the case of urban areas, the Census of population normally will carry information regarding census tracts. Where urban areas are involved, this will be a good source of information.

A publication that will be useful in analysis of economic conditions is the "County and City Data Book", a supplement to the Statistical Abstract of the United States, published by the Bureau of the Census. The 1967 edition contains statistical data for each county, 224 SMSAs, and 683 cities with 25,000 or more inhabitants in 1960. The 1967 issue is out of print, but may be found in libraries. The 1972 edition is in preparation. Data sources for the 1967 edition include the 1962 census of governments, 1963 censuses of business, manufactures and mineral industries, the 1964 census of agriculture, and 1960 censuses of population and housing. It would be desirable for economists to have the 1972 edition when it is available.

Various state agencies usually will have statistical studies or reports that deal with business activities and economic conditions within the state. Normally good sources here will be state or regional planning commissions. Often Universities have developed information of this nature either as their own research projects or under contract with state agencies. These groups usually are happy to find someone with a use for their data and cooperate fully.

Other Inventories -

Much of the material in Environmental Statements deals with biological resources. Usually this is in descriptive terms with little attention given to economic aspects. Economic data is needed in order to appraise trade offs realistically. For example, an alternative to providing a water supply to dilute municipal sewage effluent is to improve the sewage treatment. Usually a comparison of the cost of the two is as far as current thinking goes. However, it has been found that sludge from treatment plants in locations where there is considerable heavy industry is likely to contain heavy minerals. If sludge of this type is deposited on agricultural land it tends to poison the soil. This constitutes a secondary cost of the municipal treatment that, though real, is generally overlooked.

Disease bearing vectors also cause costs that are not usually counted. Some have said that in early days half of the typical southern doctor's fees resulted from treatment of malaria. Press Service, USDA, release 2195-73 carried warnings that mosquitoes would be a threat to carry Anasplasmosis to cattle through September. Mosquitoes were carriers of equine encephalitis in the recent outbreak. Children suffering from rat bites in flood prone areas were mentioned in a recent environmental statement but no costs were assigned. Where such conditions exist, they should be described and an attempt made to determine from doctors and veterinarians the costs in terms of lost time and treatment expense involved.

"Notes on Developments in Economics-No. 6" cited cases where values were assigned to fish killed on account of pollution in North Carolina and Alabama. In both of these cases the basis for evaluation was the replacement cost of the fish. Data of this type should be obtainable from fish hatcheries. However the 1971 annual report of EPA showed that agriculture was responsible for only about 8 percent of the pollution-caused fish kill in 1970. More information on this can be found in Economic Notes No. 9.

A representative of the Louisiana Wildlife and Fisheries Commission reported that the average deer hunter in Louisiana spent \$9.50 per day of hunting for deer and that about 15 days of hunting were needed for one deer. This constitutes a measurement for harvested deer only as reported in Economic Notes No. 7.

Research Report No. 25, "The Economic Value of Streams for Fishing," by Dennis H. Bianchi, University of Kentucky Water Resources Institute, Lexington, Kentucky, 1969, gives values per fisherman day ranging from \$0.97 to \$1.83 for normal streams. Values were closely correlated with size of stream.

Much information on recreational expenditures attached to hunting and fishing is contained in Resource Publication No. 95, "National Survey of Fishing and Hunting, 1970" by the Bureau of Sports Fisheries and Wildlife. This is unusual in that a charge of \$10.50 per week was deducted from the subsistence item to account for the difference between restaurant meals and the cost of meals at home if the participant were not fishing or hunting. (Most expenditure studies do not include this distinction.)

In localities where hunting or fishing is on a fee or lease basis, the economist can obtain information specific to the area from the landowners and other local sources.

A common situation in primarily rural areas is for people to migrate elsewhere in search of better living conditions. University Economics and Sociology Departments have studied these conditions and made reports on causes. For example, Clemson University Bulletin 555, "Migration of Youth From Rural Households In The Northeast Coastal Plain of South Carolina" shows that about 55 percent of the Blacks migrating to places outside the South come from households with family income of less than \$2,000 annually.

A regional economic cost is involved in such situations. First, the community has spent its funds in providing education and social services to the people who migrate. The economist may be able to obtain estimates of the extent of emigration from local sources. Costs of operating the school system can be broken down into a per capita daily cost based on average attendance as an approximation.

Information can be gleaned from city and/or county tax offices as to the basis for appraising property for taxation and the applicable tax rates. At the same time data on the millage for different purposes can be obtained. Aid from State and Federal funding would be supplemental information to be obtained. Officials also could be expected to supply their ideas on public functions that stand most in need of improvement if sufficient funds were available. Naturally their estimates can be supplemented by routine observation such as the condition of streets and roads.

In many flatland areas people have built their houses on piers so that although water may stand under the house and in the yard for several days, it will hardly ever get into the house. Although the immediate physical damage may be low, the inconvenience and possible health hazards make such housing rather undesirable. This can be expected to be reflected in the market value of the property. If these conditions are relieved, an up-grading of market values can be expected with direct results on the tax base.

Market values of agricultural property are reflective of the stream of returns expected in the future. If these returns are reduced by flood problems, inadequate drainage, etc., the value and consequent tax base also will be affected.

This discussion of inventories needed to determine the environmental setting adequately is not intended to cover all situations. It is primarily an attempt to point out some of the factors that need to be explored in order to meet the requirements of Advisory WS-26. Obviously, in preparing time schedules and plans of work, the extra investigations need to be considered. Until the inventory of the existing situation is completed, one does not have information to formulate the best project, appraise its alternatives, or choose among possible alternatives.

The Planned Project

When physical, economic and social inventories have been made, opportunities for improvement will stand out. Then a project can be formulated which will address the problems that have been found.

In Environmental Statements sometimes features of the project that will minimize environmental damage are discussed but they cannot be found in the work plan. Likely this has arisen because in many cases the work plan was developed, or largely so, before environmental aspects became critical. It should be remembered that the Environmental Statement is a responsibility of the Service but the work plan is an agreement between the Service and the S.L.O. Thus if the activity described requires a contribution from the S.L.O., even if only land rights, the sponsors have made ~~no~~ commitment unless it is included also in the work plan or a supplement.

Attention needs to be given in describing the project to operation and maintenance. Costs assigned to O&M should be realistic and set forth clearly as average annual costs. Sometimes the distinction between annual O&M costs and the installation cost has not been made clear. At times, the need for replacement of comparatively short-lived components of the project have not been specified, nor probable costs such replacements been estimated.

Consideration may need to be given to clearly distinguishing between the nature of costs for land treatment and for structural measures. Comments from people outside the Service indicate that this often is an area of confusion. This is evidenced by material presented to the Subcommittee on Priorities and Economy in Government. Researchers for one of the presentations suggested that if land treatment costs were charged against structural measures, a project would have an unfavorable B/C ratio.

At times it may be desirable to show costs attached to installation and/or maintenance of specific mitigating measures. These could be shown as PL 566 and other costs as well as for total costs. Many readers of Environmental Statements may think that a project consists mainly of providing benefits from Federal funds to private landowners and do not know that a considerable local contribution is likely to be required.

ENVIRONMENTAL IMPACT

Proper evaluation of the environmental setting not only will have supplied information on the existing environment but also will have established trends and conditions upon which the environment in the foreseeable future can be projected. It is with this future environments that project impacts should be assessed. Installation of a project where planning is done today probably will not be complete until 10 years have elapsed. Major changes often can be expected even in this relatively short time. When the whole project life is considered, changes can be drastic.

During the past ten years, for example, there has been much clearing of woods for soybean production. The emerging demand in connection with higher standards of living both in "developing" and other countries has been responsible for a favorable price structure for soybeans. When one considers that soybeans are a valuable protein source for feed and for human consumption, it would appear that this pressure will continue and that land now in woods suitable for soybean production may continue to be cleared. In fact, installation of the project land treatment measures may prevent the clearing of some unsuitable lands. Careful formulation of a project, together with publicizing information regarding the protection that will be afforded even may inhibit clearing of marginal lands. It is important that the Environmental Setting section show an objective exposition of what can be expected without positive action. The impact and alternatives sections then would show the impacts of the projects or its alternatives on this condition.

If the various items discussed in this paper under "Environmental Setting" and other pertinent subjects have been analyzed and discussed in the Environmental Setting Section of the Statement, the Environmental Impacts section should discuss project effects upon each. Appropriate indirect or probable incidental effects should be considered.

As an example, flood protection may reduce the expenditures of local government bodies for maintenance of roads and bridges. This may divert funds now spent for this purpose to more productive purposes. At the same time, relief from flood losses may increase the value of private property thereby increasing the tax base. The increased revenue then could be used for providing a better school system, improved fire protection, a more effective police system, or whatever is needed most.

Much work is being done by State agencies and Universities in appraising multiplier effects (increases in economic activity) as a result of changes in production and employment. Reference to some of this work has been made in various "Notes on Developments in Economics" and in minutes of the Economics Workshops held in Columbia, South Carolina and Fort Worth, Texas. Most states have prepared reports of studies. Discussions with personnel preparing such reports will aid in their interpretation and are likely to bring out much background data not published. Often advance drafts of reports of this type can be obtained. These reports and analyses can be used to assess project impacts upon employment and economic activity.

The land treatment measures that are a part of project installation will have an effect upon agricultural income by making changes in the use of the land according to its capability. Some changes will be made as a result of continuing the going program. The project can be expected to be responsible only for the difference between what will result from acceleration as compared to the going program.

Questions often are raised by reviewers regarding the effect of increased use of fertilizer as a result of the project adding to water pollution. Although ARS has done much research on water pollution from fertilizer, insecticides and other agricultural sources, misinformation is still rampant. Pertinent papers were presented at the ARS-SCS Workshop on Pollution, June 22-24, 1971, at the USDA Sedimentation Laboratory, Oxford, Mississippi. The following are all by ARS researchers:

"Nutrient Aspects of Sediment in Reservoirs" by D. L. Rausch;
"Pollution Aspects of Fertilizer Phosphorous" by L. L. McDowell;
"Pollution Aspects of Fertilizer Nitrogen" by S. J. Smith;
"Pollution from Fertilizers" by Guy D. Smith; and
"Pollution Problems of Pesticides" by A. W. Taylor.

These and other study reports indicate that sediment is the major carrier of agricultural pollutants. Thus, a reduction in sediment production is likely to reduce pollution from agricultural sources. The economist, as well as other members of the staff, should have some knowledge in this field.

Alternatives

The land treatment alternative only should show the impact and costs only of accelerated treatment over those that would be occasioned by the "no project" alternative. The latter would not show the existing condition but that which could be expected from a continuation of trends and on-going programs.

With computer programs available, it is possible to examine a number of possible structural programs. Numbers of structures and their release

rates can be varied. Channel work should be based on a definite showing that the best system of floodwater retarding structures will not do an adequate job.

A statement that refers to "the desired level of protection" appears in many work plans. It could be expected that local sponsors might "desire" complete freedom from flooding if it were possible. Therefore such a statement is weak. The level of flood protection sought needs to be based upon values to be protected and their susceptibility to damage. These may often be trade offs where something less than the optimum protection against flooding may be accepted in order to gain other values.

Summary

This statement has tried to suggest a few of the explorations that may be needed in order to prepare a supportable Environmental Statement. It is not designed to set forth all of the fields of investigation that may be needed. It is expected that the planning staff will find other matters equally as important in a given watershed.

It can be seen that investigations and analyses for an Environmental Statement that will support a project will be expensive and time consuming. In preparing these statements it should be kept in mind that those who question the project are sincere, but they are likely not to be fully informed as to all of the issues involved or the technical requirements to meet the most pressing needs. The purpose of the Environmental Statement is to present this information as clearly and factually as possible.

HYDROLOGIC INVESTIGATIONS
FOR
WORK PLAN AND ENVIRONMENTAL STATEMENT DEVELOPMENT

Additional hydrologic investigations will be required in the development of future work plans and environmental statements. The following list has been developed as a checklist insofar as it is applicable to the watershed under consideration. Additional narrative would also be included in the work plan and the environmental statement to take credit for the various hydrologic studies and analyses that have been made.

In addition to the material included herein, it is recommended that a careful review be made of Advisory WS-26, dated June 25, 1973, which contains many additional pertinent suggestions and guidelines for improving the quality of environmental statements prepared by the Soil Conservation Service for watershed projects.

WATER QUALITY

Describe current water quality problems such as pollution from sewage treatment plant effluent, industrial waste discharge, feedlot, surface runoff, fertilizers, waste water, untreated sewage from residential property, etc.

Discuss present quality of water and how the proposed project will change it, if at all.

Check on the suitability of water for Municipal and Industrial use. Describe the M & I water quality studies made by the city's consultant. Be sure that the quality of the water will meet either the local, state, or U.S. Public Health Service quality standards. Information on the water quality of many streams is available from these agencies or the Environmental Protection Agency regional office. Will the contributing runoff area be monitored to check against pollution from sources other than soil erosion?

If swimming will be permitted in a proposed reservoir, check on water quality insofar as suitability for water contact sports is concerned.

For low-flow augmentation, consider modification of the principal spillway of the floodwater retarding structure to include ungated ports to release water at predetermined rates (in consultation with State and Federal Fish and Wildlife agencies) to maintain streamflow during the dry summer months. The elevation of the ungated ports will be set at the elevation of the first 50-year sediment pool level. In view of these modifications, no thermal or chemical stratification of water impounded in the reservoir will result.

Frank P. Erichsen, Hydraulic Engineer, South Regional Technical Service Center, Fort Worth, Texas

Downstream oxygen and temperature levels will not be adversely altered by the floodwater retarding structure.

Describe the design of principal spillways in floodwater retarding structures to take cool water from the bottom of sediment storage pools and release it to offset the temperature increase of water stored at the top of the sediment pool. This avoids increasing downstream water temperature, and by proper design the dissolved oxygen content of water can be increased.

Have the consultant describe the method to be used and capacity of existing or planned water treatment plants in conjunction with M & I storage reservoirs.

Give consideration to designing discharge structures to provide the maximum turbulence and aeration in order to enhance downstream water quality. Discuss existing dissolved oxygen level at specific points and how much it will increase during spillway operation. Indicate the dissolved oxygen saturation level and how nearly this level will be attained as a result of structure operation.

Current water quality chemical information should be discussed in the environmental statement. List parameters such as phosphorus, nitrogen, biochemical oxygen demand, dissolved oxygen carbon dioxide, acidity, alkalinity, etc.

Current water quality physical information should be discussed in the environmental statement. List such items as temperature, turbidity, color, odor, pH, suspended solids, etc.

HYDROLOGIC ANALYSES AND SUGGESTIONS

Show hydrographs and stages for a few locations downstream from the project.

Show hydrograph shapes (without and with project) at selected locations for various frequency events (graphical).

Show discharge stages (without and with project) at selected locations for various frequency events (tabular presentation).

Explain the effect of proposed channel work on possible induced damages within and outside of the watershed. This should be a factual statement--stage increase, change in acres flooded, added damage (if any).

Explain how the water surface profiles were developed to determine the discharge rating curves at every valley section. Tell how many valley sections were used to determine the water surface profiles.

Describe the frequency of present floods, such as "Flooding of the agricultural area occurs on the average of about two to three times per year. Floods large enough to cause damage to residential, commercial, or industrial property occur about once every 5 years. The largest known floods are listed as follows:"

Determine the damage associated with floods for various frequencies, 100-year, 25-year, 10-year, 5-year, etc., and indicate depth overbank at various points.

Show typical valley cross sections and flood stages without and with project.

If urbanization is causing more frequent flooding and higher stages and discharges, this might be pointed out with some specific data shown.

Describe past floods of record--date - amounts of rain - damage resulting - homes damaged - crops destroyed - personal property damage - persons drowned - damage to commercial, industrial, and public property - etc.

Describe type of streamflow now, such as : Is it continual base flow? - What is the variation in flow? - Is there no flow at all for certain periods of time? How will project modify any of these flows? For example, installing a small port at 50-year level to provide some flow for say a 6-month period. Storage for low-flow augmentation is to be considered.

In an urban area, delineate the present 100-year flood line and show the future flood lines with project. Show on a map and describe in detail the changes which will result when urban protection is a project purpose. Discuss the number of homes, businesses, etc. flooded at present and in future; include depth of flooding, frequency of flooding, etc.

Describe changes in hydrologic cover condition in woodlands, etc.

Discuss effectiveness of proposed structural plan. Determine the percent of upland watershed area being regulated through floodwater retarding structures. Give general data regarding significant features of the structural program, that is, number of dams, height of dams, release rates, miles of channel work, etc. Tie this in with data from Table 3.

Discuss level of protection in urban areas and agricultural areas with project in effect.

Discuss the effect that the proposed structural measures would have had on specific large floods in the past which would be meaningful to local people. Show reduction in stage at representative valley sections shown on the project map.

Discuss zoning, floodproofing, or other measures proposed by sponsors for low-lying areas still subject to flooding.

If the proposed plan will reduce the depth of flooding for the 100-year flood to an elevation below the floor elevation of buildings or non-damaging stages, make this comment in the work plan and environmental statement. If some residences, etc. are still flood prone, point this out too.

Take credit, if applicable, that there will be no apparent risk of loss of life with the proposed project in place; and that flooding from the 100-year flood event will be limited to such property as yards, streets, gardens, parking lots, agricultural areas, etc.

Discuss in detail various alternatives considered and conclusions reached, including both not limited to:

- a. Conservation land treatment alone
- b. Purchase of flood plain land and land use conversions
- c. Floodproofing and flood plain zoning
- d. Floodwater retarding structures alone (in various combinations)
- e. Channel work alone
- f. Combinations of d. and e.
- g. A no-project alternative

Point out that the conservation measures will provide more adequate cover, improve infiltration and physical conditions of the soil, reduce erosion and sediment production, etc. Point out that improving the forest land will reduce the effects of runoff, erosion and sediment problems arising on agricultural and urban lands.

Include an estimate of the number of farms and industrial, commercial, and residential properties which will benefit by reduced stages or elimination of flooding as a result of the proposed program.

Show the effect in percent that the land treatment and structural measures will have in reducing existing average annual damages as shown in Table 5.

If low-lying areas in the flood plain, still subject to flooding in the future will be changed from fixed improvements to such measures as parks or other better uses, this should be indicated.

How do existing bridge capacities affect large flows - now and in future?

Describe how many surface acres of water will be added as a result of the project. In some cases this will result in a water loss because of evaporation exceeding rainfall on the sediment or M & I pool areas. If this is the case, point it out as an adverse effect.

Discuss the comparison between the regulated flow released from the structures (through the port in the riser) and the minimum existing natural streamflow.

Discuss the procedure used to determine peak discharges for various frequencies and comparisons by use of SCS Technical Release No. 20 model routings to check observe or regionalized discharge values.

PROPER FORMAT AND CONTENT AND COMMON
DEFICIENCIES OF ENVIRONMENTAL STATEMENTS

Discussion by:

Gerold Lanman

Outline

I. Format

- A. Watersheds Advisory No. 26
- B. Up-coming changes in Watershed Protection Handbook

II. Content

- A. Emphasis on Reference Material
- B. Emphasis on use of pictures, drawings, etc.
- C. Problems in describing impacts. Ref. EVT Advisory 27
- D. Problems in describing alternatives
- E. Emphasis on describing Conservation Land Treatment program and resulting impacts, with special emphasis on agricultural chemicals.

III. Common Deficiencies

- A. Spelling
- B. Typographical
- C. Grammar

Friday, August 31 - Discussion of Selected Problems in Each State:

Georgia - Discussion Leader - Frank Lowery

Attachment 1 - Problem -- Kiokee Watershed

Attachment 2 - Proposal

Answers to Questions:

Additional upstream sites were studied but could not be justified. The project was studied without the channel and adequate protection could not be provided. Flooding would be reduced from 4 to 2 per year. Although families working in Atlanta are building homes in the watershed, the bottomland is expected to stay in agricultural uses. O. & M. is a problem as the state agency is questioning it, although at one time the sponsors offered to buy the land and turn it over to the state.

North Carolina - Discussion Leader - John Garrett

Problem: Getting across to the reviewer that the material is in the plan and statement -- if he will study them.

Answer: Simple counts and studies.

Illustrations and pictures.

Have data in file - to support general statement.

Attachment 3 - Special studies to answer comments.

South Carolina - Discussion Leader - Jim Kesecker

Attachment 4 - Problem and how it was handled. Comments included Senate Document 97 may have been listed and the response should have stated, "we concur. See addition to Section 1, Planned Project." This would help the tone of the response.

Review of the Environmental Statement group work.

Georgia - Robert Robison - the group consisted of the people from Georgia assisted by Joe Haugh. (Attachment 5)

North Carolina - Tom Honeycutt - the group from North Carolina was assisted by Gerold Lanman. (Attachment 6)

South Carolina - Jim Nicholson - Doug Peet assisted South Carolina staff. In answer to question on objectives, Gerold Lanman said the objectives section of the national guidelines will be rewritten. (attachment 7)

SPECIAL PROBLEM

Kiokee Creek Watershed

The Kiokee Creek Watershed is located in the Savannah River Basin in the Piedmont and Upper Coastal Plain Physiographic Provinces of east-central Georgia. Portions of Columbia and McDuffie Counties are located within the watershed boundary. The watershed consists of 65,290 acres with 53,785 acres in Columbia County and 11,505 acres in McDuffie County. It is approximately 18 miles long with an average width of 5.5 miles.

The topography is gently to strongly rolling with the steeper slopes being near major streams. Elevation extremes range from approximately 557 feet above mean sea level near Dearing at the head of the watershed to 185 feet above mean sea level at the confluence of Kiokee Creek and the Savannah River. A small monadnock, Burks Mountain (elevation 535) along the northern boundary, near the Savannah River increases the local relief in the downstream portion.

The major upland soils are: Appling, Cecil, Madison, Grover, Helena, Lake-land, and Norfolk sandy and silty clay loams. The major bottomland soils are Congaree, Chewacla silt loam and alluvial soil. These bottomland soils are primarily classes IIw and IIIw. The flood plain in most places is clearly distinguishable, generally having near level slopes perpendicular to the streams. However, some low old stream terraces are present in several locations adjacent to the flood plain.

The flood plain land adjacent to Kiokee Creek and its main tributaries is flooded frequently due to the relatively high rate of runoff, flat flood plain, and intermittently clogged and crooked stream channels. The 1964 flood, the largest known, inundated 4,595 acres which includes the common flood plain of the Savannah River. Most of the flood plain has been withdrawn from row crops and is presently in pasture, swamp and brush, woodland or idle. The swamped out areas are brought about by frequent flooding and beaver dams. About 360 acres are presently flooded by beaver dams.

A preliminary draft work plan was completed in 1970. Included in the plan was conservation land treatment, floodwater retarding structures (including multiple purpose structures for irrigation, recreation and industrial water supply) and channel work. Channel work through a complex of beaver dams is necessary to provide protection (outlet) for upstream flood plain in agricultural use.

After reviewing the plan draft, the Bureau of Sport Fisheries and Wildlife and Georgia Game and Fish Division objected to the channel work proposed. Planning staff personnel, sponsors, and biologists representing the Soil Conservation Service, Bureau of Sport Fisheries and Wildlife and the Georgia Game and Fish Division worked out construction procedures and mitigation measures acceptable to agency field level biologists. The plan draft was revised to include less than one-half mile of selective snagging and debris removal and 5.7 miles of excavation. Channel excavation through the beaver pond area was modified to become a part of a waterfowl area. In this wildlife improvement area, spoil from the excavated channel will be placed so as to form a dike approximately five feet high along the side of the stream. A series of

SPECIAL PROBLEM - Kiokee Creek Watershed

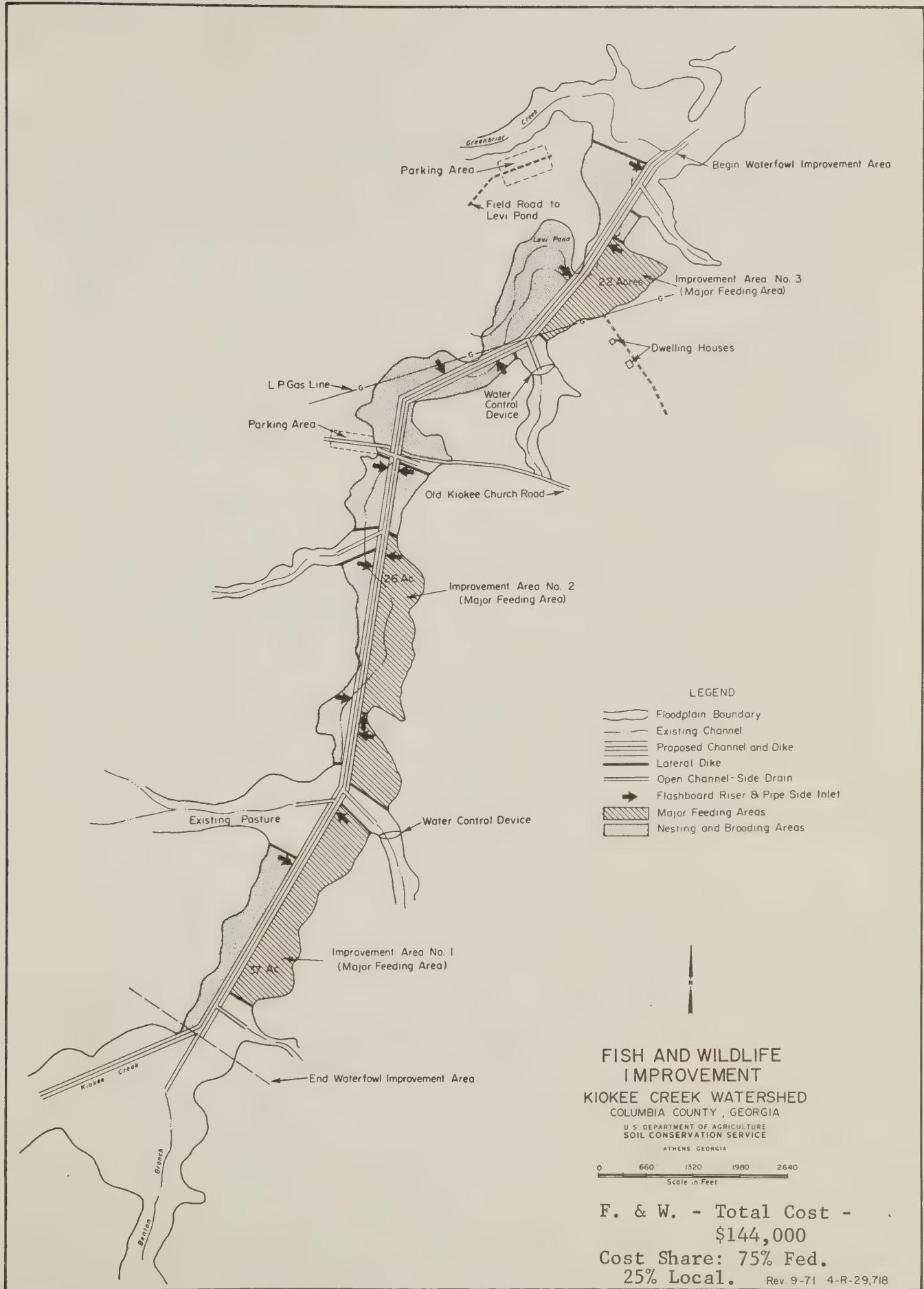
lateral dikes will be constructed in order to maintain the water level on the flood plain area. Flashboard riser drop inlet structures will be placed at the lower end of the diked areas to control the water level. The dikes will also allow floodwater from major tributaries to enter the main channel without overflowing into the diked areas. Vegetated emergency spillways will be constructed on the upland side of the dikes to allow floodwater to pass into the open channel side inlets. Material to build the dikes will be from flood plain area above the dike, leaving undrained pockets of water.

Three of the diked areas will be used as major feeding areas. These areas will be planted and flooded each year. In order to flood these areas, a portable pumping system will be used. Water will be pumped from the main channel. As a supplemental source of water, island type flashboard risers will be installed in the two side tributaries to divert the normal flow into the development areas when flooding is needed. An additional source of water will be stored in one of the diked areas.

Other diked areas will be used for nesting and brooding areas. These will remain flooded at all times and approximately 300 wood duck nesting boxes will be erected. Public hunting on this 360 acre area will be allowed during open seasons.

The draft environmental statement shows that the project will enhance fishing and waterfowl hunting on this area as a favorable impact. Without the mitigating measures previously described, drainage of this area would have adversely affected fish and wildlife habitat.

Although the waterfowl development was an acceptable mitigation as far as state and federal biologists (field level) were concerned, the present Director of the Game and Fish Division opposes the project. His opposition is to channel work included in plan. The previous Director had expressed approval "on an experimental basis". This concurrence was by letter to the State Conservationist.



ENVIRONMENTAL STATEMENT PROBLEMS

North Carolina has experienced difficulty evaluating impacts of several watershed projects in the eastern part of the state. One of the problems encountered has been the attempt to evaluate the impact of the proposed Chicod Creek Watershed project on its anadramous fishes. This flatland watershed lies about 30 miles to the west of the Tar-Pamlico estuary system and outlets directly into Tar River. Its drainage system is featured by swampy conditions in the lower end of the watershed and many drainageways with little or no discernible run because of channel fill. Sixty-six miles of channel improvement are proposed to reduce flooding hazards and provide outlets for on-farm drainage systems. Several species of anadramous fish, including herring, American shad, and striped bass, have been reported to use the creek and its tributaries as spawning grounds. There has been concern by several state and federal agencies over possible detrimental effects (destruction of eggs, endangering of fish larvae, increased mortalities, etc.) of the project on these species.

The evaluation of this project impact is difficult in that there is not available sufficient time to do long term research, population counts, comprehensive studies, etc., on these possible effects. The Soil Conservation Service has, however, begun to make studies to develop some basis for evaluating these effects. Eight sampling stations were established in the watershed in 1973 to determine the extent of migration of fish upstream, species present, presence of eggs, and other relevant factors. These are the first records of this type known to be obtained from the watershed. A contract has also been let to a private engineering firm to do a thorough literature search for research reports that would be relevant to this and other impacts of the project. It is hoped that the firm will make some specific recommendations for evaluating this and other project impacts in their final report. This report and the field studies initiated are hoped to be significant and useful steps in evaluating this particular impact of the Chicod Creek Watershed Project.

Thomas V. Honeycutt Jr.

THOMAS V. HONEYCUTT, JR.
Soil Conservation Service
River Basin-Watershed Planning Staff

August 28, 1973

BEAVERDAM CREEK WATERSHED
Anderson and Oconee Counties, South Carolina

Watershed Area - 24,300 acres

Approved for Operation - April 1, 1969

Work Plan included:
land treatment measures
critical area treatment
four floodwater retarding structures
12 miles of stream channel work

Structures completed:

two floodwater retarding structures
three miles of stream channel work

Environmental Statement prepared for completing the project. Draft Statement submitted to Council on Environmental Quality and made available to the public on May 18, 1973. Comments were requested from other agencies by July 23, 1973.

Jaret C. Johnson (Member, National Wildlife Federation)

Comment (1): Upland erosion is a primary cause for sediment clogging channels and resultant flooding. Land treatment measures to restore these lands to more stable hydrologic condition are commendable. Restoration of the stream beds to their former natural free-flowing condition also seems wise.

Response: Concur.

Comment (2): Structural measures proposed are highly questionable on grounds of economics and equity. The resident landowners may be entitled to restoration of lost productivity but the control of natural flooding and the elimination of swampy lands is unwise because (1) landowners were aware of flooding, and (2) it is inappropriate to ask taxpayers to pay for land reclamation for agricultural purposes when subsidies are still in effect for leaving other agricultural lands fallow.

Response: The project is not designed to eliminate natural flooding or reclaim land that has not been in agricultural production. The project is alleviating the flooding and swamping conditions which are becoming worse each year.

Comment (3): No biological community is independent of neighboring communities. The removal of 156 acres of bottom land habitat will not likely result in simple "conversion" to upland habitat. It is more probable that the upland community will be affected adversely by removing those bottom land species on which it depends.

Response: Changes that have occurred from activities of this nature indicate this is not true. Based on results of similar projects and work completed in Little Beaverdam Creek, the results as described in the Statement are expected.

Comment (4): Clearing of cover adjacent to streams invariably results in a significant rise in water temperature. This effect and its impact on stream inhabitants is not mentioned in this draft.

Response: See addition to Section 1, "Planned Project".

Comment (5): The physical mode of releasing water from impoundments should be discussed.

Response: Additional description has been added to Section 1, "Planned Project".

Comment (6): A request was made that a more detailed draft Statement be circulated which would include (1) more rigorous and detailed description of "Alternatives", and (2) responses to the three areas covered in Section "B" of this letter.

Response: See responses to individual comments and changes made with additions to Section 5, "Alternatives".

Columbia Audubon Society

Comment (1): The project should be restudied from an economic viewpoint, since the value of the land that would be subject to reduced flooding is of low value, small demand, and the cost of protecting it is comparatively unduly high.

Response: Current criteria and policy were followed in the evaluation of the project. Procedures outlined in the Soil Conservation Service Economics Guide and Watershed Protection Handbook have been used to evaluate the economic effect. Reasonable, practical alternatives that could be implemented have been considered. No changes have been made.

Comment (2): The project should be placed in perspective in terms of the land use and employment trends in South Carolina, and especially that use of other land in South Carolina that is idle but could be farmed be considered as a positive and feasible alternative.

Response: Under our existing governmental arrangements, it is questionable that a sponsor could be denied assistance for which he is clearly eligible on the basis that this assistance will increase production but this increase should occur in some other location. See response to Comment (1). No changes have been made.

Comment (3): Recreational benefits attributed to Structures 2 and 3 should be given no dollar value in the benefit-cost ratio since the impoundments are superfluous to the existing recreational opportunities in the watershed.

Response: The incidental recreation benefit listed has been determined based upon expected use. This is expected because other completed projects of this nature are providing a similar use for recreation. Even though Lake Hartwell, a large reservoir on the Savannah River, is nearby these small sediment pools offer many individuals unique high value

1. Set up a spread sheet for checking environmental issues:

<u>Environmental Resources</u>	<u>Problems</u>	<u>Impacts</u>
(list these)	(check to see if those listed under first column are covered)	(check - same as problem)

2. Glossary - possibly make this a regional or national item - SCSA glossary - don't use SCS jargon.
3. Use of pictures, drawings, sketches, maps, exhibits (keep them relative). This was presented as a good idea.
4. Use of footnotes -- the need for these was stressed in several places.
5. Build data such as water quality from the beginning.
 - a. Possible use outside contracting.
 - b. Keep good records of meetings and telephone calls.
 - c. National Agricultural Library
6. Data in State Office and RTSC to use in ES. Biography is recommended.
7. Listing meetings and names of people attending - comment - agency listing may be preferred.
8. Alternatives should include all adverse environmental effects.
9. Handling conflicting comments from various organizations and the same organization.

1. Comments were minor in scope.
2. No significant deficiencies.
3. Need to expand the Plant Communities (linkages).
4. Local pictures would help.
5. Get sediment figures in perspective.
6. Impacts of operation and maintenance section on resources.
7. Additional references needed in places.
8. Alternatives - set the stage a little better for reader to infer reasons for rejection.
9. Some problems information should go in setting.

With Douglas Peet, the five from South Carolina reviewed the first typing (42 pages) of an environmental statement for Rabon Creek Watershed Project.

Notes made regarding suggestions for improving the statement include:

1. One-half or more of the information under Project Objectives and Purposes should be either eliminated or moved to other sections.
2. Watch the use of words such as: most, part, improve, minimize, adequate.
3. Try to use terms that are not strictly SCS terminology.
4. Under planned project - structural measures include a better description of a floodwater retarding structure - method of releasing water, have a picture - include a typical cross section - and avoid technical terms.
5. Include a table indicating amount of land and land use of the area needed for the structures.
6. Modify list of actions to be followed to avoid erosion and pollution during construction and include air quality - health.
7. Suggestion was made to consider monitoring water quality above and below construction sites during construction.
8. Add a statement relating to compliance with PL 86-523, and a statement as to the designed life and sediment pool storage.
9. Minor rewording in O. & M. section.
10. Add a description of the region and subregion under Physical Resources.
11. Add a description in nontechnical terms of land capabilities and definition.
12. Include more description on stream channel classifications as to flow and conditions.
13. Reference points used in the narrative should be found on the project map.
14. Try to improve readability of economic resources by rearranging some topics that were discussed.
15. Add to Soil, Water and Plant Management Status section a description of trends - expected land use - projections - without a project.
16. Strengthen the section of floodwater damage by showing reaches on project map and presenting data by reach.

17. Give project erosion and sediment damages expected in the future without project.
18. Omit Drainage Problems and Irrigation Problems unless the land treatment program or structural measures involve these purposes.
19. Add physical effects and impact of land treatment measures to the section on Impacts, also forest land and water quality.
20. Structural measure impacts on flood damages should be described by reach and include the net impact to the beneficiary. Do not stop with just physical impact.
21. In this statement, considerable changes should be made in the alternative section.
22. It appears that sufficient data and information have been obtained to prepare a suitable statement for review.

ATTENDANTS

Washington:

Joseph S. Haugh
Karl Klingelhofer
Gerold L. Lanman

South RTSC:

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Jack W. Adair
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Brown Nevels
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Robert C. Robison
Bob Terry

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Phil J. Edwards
Royce W. Esprey
Herbert J. Fox, Jr.
John J. Garrett
Tom V. Honeycutt, Jr.

South Carolina:

Wilbur Campbell
James M. Kesecker
Hugh F. Longshore, Jr.
Gerald R. Melton

1/ First day

Local Arrangements:

Brack Williams, Charlotte, N. C.

